



Arkansas NPS Management Program
2006-2010 Update
Arkansas Natural Resources Commission • October 1, 2005.

Section One

Introduction

2006-2010 NPS Management Program Update

The Arkansas 2006-2010 Nonpoint Source Pollution (NPS) Management Program Update (Update) is intended to serve as a statewide reference. The 2006-2010 Update is to be used in conjunction with the Inventory of Impaired Water Bodies (303(d) report) and Water Quality Assessment Report (305(b) report) prepared every other year by the Arkansas Department of Environmental Quality. The Update's purpose is to provide an over-arching guide to develop, coordinate, and implement plans and programs to reduce, manage or abate nonpoint source (NPS) pollution. This 2006-2010 Update provides a focal point for public agencies, nonprofit organizations, interest groups and citizens to discuss and address nonpoint source pollution together.

Arkansas' current NPS Management Program was developed in 1997 and covers the period 1998 through 2002. An amendment was prepared in 2002 that provided interim guidance for 2003-2004. After reviewing significant changes that have occurred since 1997 and changes in Arkansas' landscape, the Arkansas Natural Resource Commission, formerly the Arkansas Soil and Water Conservation Commission, undertook a major review and update of the Arkansas NPS Management Program.

Significant regulatory and voluntary program changes that have occurred since the current plan was developed coupled with significant changes in Arkansas' landscape and continued improvements in BMPs. These changes caused ANRC and its partners to decide in FFY 2004 to undertake a major update of Arkansas' Nonpoint Source Pollution Management Program. The bulk of the review and update took place in FFY 2005.

In response to significant federal policy and regulatory changes that have occurred since the current plan was developed in 1997, ANRC needs to adapt its NPS management program. Some of the policy and regulatory changes that make program changes necessary include:

- EPA implemented new rules for confined animal feeding operations and animal feeding operations (CAFO/AFO).
- EPA's Phase II Stormwater regulations went into effect substantially increasing the number of municipalities and construction sites required to obtain NPDES permits.
- EPA accelerated implementation of the TMDL program nationwide.
- EPA issued new guidance for Section 319(h) of the Clean Water Act on October 23, 2003, which guides planning and implementation of states' nonpoint source pollution management programs.
- The 2002 Farm Bill expanded existing conservation programs and established new programs.

Regulatory and organizational changes also have occurred at the state level, including:

- Arkansas enacted significant new regulations defining nutrient surplus areas and establishing requirements for nutrient plans and application of nutrients in surplus areas.

- Arkansas enacted regulations requiring poultry operations to register.
- The 2005 General Assembly renamed the Arkansas Soil and Water Conservation Commission the Arkansas Natural Resource Commission. In separate legislation, the 2005 General Assembly combined the Arkansas Plant Board, the Arkansas Livestock and Poultry Commission, the Arkansas Forestry Commission and the Rural Development Commission to form the Arkansas Department of Agriculture.

In addition to regulatory changes, a wide range of voluntary programs have been implemented since 1997 to promote voluntary use of best management practices, such as:

- Arkansas has developed guidelines for silviculture best management practices. The Arkansas Forestry Commission monitors and reports implementation of these best management practices every other year. Implementation has increased steadily since monitoring began.
- Arkansas has developed best management practices for resource extraction. The Arkansas Department of Environmental Quality monitors implementation of these best management practices.
- Entities providing training on best management practices for animal agriculture meet regularly and work together to promote consistency of their messages and coordination of efforts.
- Local elected leaders in Northwest Arkansas have formed a coalition to work together under the auspices of the Northwest Arkansas Regional Planning Commission with technical support from the University of Arkansas Cooperative Extension Service to reduce urban sources of nonpoint source pollution and comply with new MS4 regulations.

Appendix E provides a brief overview of the regulatory framework. In addition, Arkansas' landscape has undergone significant change since the current plan was developed. NPS management measures and best management practices have improved as well. Taken together, these changes point to an urgent need to review and update Arkansas NPS Management Program.

I. The Changing Landscape

Arkansas' landscape is changing rapidly. Examples include:

- Land use evolves with changing population and economic conditions. Figure 1.2 shows land uses in 1999.
- Population continues to grow rapidly in Northwest Arkansas. Figure 1.3 shows population change from 1990-2000.
- Population decline has accelerated in the Delta and many other rural counties of the state since 2000. Figure 1.4 shows estimated population change from 2000-2004.
- Value of construction remained higher in Pulaski County than any other county in 2002 (Figure 1.5).
- Cropland acres harvested declined 2.7% statewide from 1997 to 2002, mostly in the Mississippi Alluvial Plain. Figure 1.6 shows row crop agriculture in 1999.

- Marginal croplands in the Mississippi Alluvial Plain are being placed in conservation programs and easements at an increasing pace.
- A growing number of acres of wetlands have been restored and bottomland hardwoods replanted since 1997.
- The number of Arkansas farms raising broilers declined from 3,660 in 1997 to 3,520 in 2002 while the number of chicks placed on farms increased from 1.3 billion to 1.4 billion over the same period (NASS, 1997, 2002). Figure 1.7 shows poultry production in 2002 while Figure 1.8 shows pastureland.
- Some industrial forests are being sold to investor groups and private landowners, creating growing land fragmentation.
- Figure 1.9 shows public lands in Arkansas.

A series of maps provide a snapshot of the changing landscape in which NPS pollution management programs will be implemented. These maps can be found at the end of this section or accessed online.

Figure 1.1: Nutrient Surplus Areas

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/nsa.pdf>

Source: Arkansas Natural Resources Commission

Figure 1.2: Arkansas Land use, 1999

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/99statetlu.pdf>

Source: Center for Advanced Spatial Technologies, Land Use-Land Cover, 1999

Figure 1.3 Population change 1990-2000, Arkansas

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/popchange90-99.pdf>

Source: University of Arkansas, Cooperative Extension Service, County Profiles, 2002.

Figure 1.4: Population Change 2000-2004, Arkansas

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/popchange02-04.pdf>

Source: University of Arkansas, Cooperative Extension Service, 2002.

Figure 1.5: Value of Construction in Millions of Dollars, 2002.

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/construction.pdf>

Source: Bureau of Economic Analysis

Figure 1.6: Arkansas Cropland, 1999

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/rowcrop.pdf>

Source: Center for Advanced Spatial Technologies, Land Use-Land Cover, 1999

Figure 1.7: Arkansas Poultry Production, 2002

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/poultry.pdf>

Source: USDA National Agricultural Statistics Service, Census of Agriculture, 2002

Figure 1.8: Arkansas Pastureland, 2002

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/pasture.pdf>

Source: Center for Advanced Spatial Technologies, Land Use-Land Cover, 1999

Figure 1.9: Public Lands in Arkansas

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/PDF/publiclands.pdf>

Source: U.S. Geological Survey

II. Surface and Groundwater Management in Arkansas

The 2005 -2009 Management Program Update dovetails closely with Arkansas' Inventory of Impaired Water Bodies and the Water Quality and the Water Quality Assessment Report. The Arkansas Natural Resources Commission (ANRC), formerly the Arkansas Soil and Water Conservation Commission (ASWCC) is responsible for the NPS Management Program and the Arkansas Department of Environmental Quality (ADEQ) is responsible for developing water quality standards, monitoring water quality and developing the inventory of impaired water bodies.

Inventory of Impaired Water Bodies: Section 303(d) of the Clean Water Act requires that states identify waters which do not meet or are not expected to meet applicable water quality standards. These water bodies are compiled into a list known as the 303(d) list in even-numbered years. The regulation (40 CFR 130.7) requires that each 303(d) list be prioritized and identify waters targeted for Total Maximum Daily Load (TMDL) development. Figure 1.10 shows streams identified as impaired in the 2004 draft inventory. Data from the inventory is used throughout this update.

Figure 1.10: 2004 Draft Inventory of Impaired Water Bodies¹

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/2004%20303d%20list.pdf>

Source: Arkansas Department of Environmental Quality

Surface Waters: Arkansas's surface waters are managed through Regulation 2: Arkansas' Surface Water Quality Standards (APCEC, 2001). The standards include designation of uses for all waters of the state, narrative or numeric criteria designed to prevent impairment of those designated uses, and a policy to prohibit degradation of waters of the state (anti-degradation policy). The water quality standards are ecoregion based; waters within each of the six ecoregions of the state have standards which were developed from data from least-disturbed streams within each ecoregion. These data were developed during an intensive, statewide study of the physical, chemical and biological characteristics of least-disturbed streams during 1983-1986.

¹ The Arkansas NPS Management Program only addresses watersheds where NPS contributes to impairment or threatens water quality. Water bodies impaired by mercury only are not addressed by Arkansas' NPS Management Program.

Arkansas Designated Uses

State Designations Uses

1. **Extraordinary Resource Waters.** Some 16% of Arkansas' total stream miles have been designated as Extraordinary Resource Waters (ERW). ERWs are characterized by scenic beauty, aesthetics, scientific values, broad scope recreation potential and intangible social values. The ERW designation gives the Arkansas Department of Environmental Quality the responsibility of providing extra protection to those waters. Figure 1.11 shows ERW waters.
2. **Ecologically Sensitive Waterbodies.** Ecologically Sensitive Waters (ESW) include segments known to provide habitat within the existing range of threatened, endangered or endemic species of aquatic or semi-aquatic life forms. Figure 1.12 shows streams designated as ESW.
3. **Natural and Scenic Waterways.** Arkansas has designated parts of five rivers as Natural and Scenic Rivers: Cossatot River, Little Missouri River, Saline River, and the Strawberry River in addition to the federally designated Natural and Scenic Rivers, which include: Big Piney Creek, Buffalo River, Cossatot River, Hurricane Creek, Little Missouri River, Mulberry River, North Sylamore Creek, and Richland Creek.

Federally Designated Uses

4. **Primary Contact Recreation.** Suitable for swimming
5. **Secondary Contact Recreation.** Suitable for wading.
6. **Fisheries.** Suitable for fishing.
7. **Domestic Water Supply**
8. **Industrial Water Supply**
9. **Agricultural Water Supply**

Designations 4-9 are federally mandated designations. Virtually all of the waters of the state are designated for uses 4-9. Waterways in categories 1-3 are considered worthy of the highest level of protection by the state because of their beauty, value or beneficial use.

Figure 1.11: Extraordinary Resource Waters

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/ERW.pdf>

Source: Arkansas Department of Environmental Quality

Figure 1.12: Ecologically Sensitive Waters

<http://baeg.uark.edu/ecoengineering/ARNPS05/maps/ESW.pdf>

Source: Arkansas Department of Environmental Quality

Groundwater Resources: Arkansas's ground water resources are managed by ADEQ's Ground Water Protection Program. The responsibilities of the ground water program include budgeting and grant administration, ground-water quality planning and water-quality monitoring, and addressing gaps in ground-water protection through the development of guidelines and regulations. The Ground Water Protection Program conducts the water-quality monitoring, including ambient monitoring and research-oriented monitoring.

The ambient ground-water monitoring program was developed in order to document existing ground-water quality in various aquifers throughout the state on a three-year rotating schedule. Because each area of the state is sampled every three years, the data are used to document trends and changes in water quality over time. Ambient ground water monitoring in Arkansas has traditionally been performed by three organizations: the United States Geological Survey (USGS), the Arkansas Department of Environmental Quality (ADEQ), and the Arkansas Department of Health (ADH). The USGS monitors 25 master wells (or springs) in fourteen aquifers throughout the state. These wells are monitored for a variety of constituents, including nutrients, metals, radioactivity, organics, and selected primary and secondary drinking water constituents. ADEQ maintains the Arkansas Ambient Ground Water Quality Program, which was initiated in 1986. The monitoring program currently consists of 195 well and spring sites in 9 different monitoring areas within the state. A full suite of inorganic parameters is analyzed for the samples, including all major cations and anions and trace metals. In addition, in areas where industry, landfills, and other facilities which store, manufacture or dispose organic chemicals, semi-volatile and volatile organic analyses are performed on the samples. Areas with row-crop agriculture commonly include pesticide analyses. The ADH monitors public water supply wells (treated water only) in Arkansas. Analyses by ADH include bacteriological, nitrate, and other basic water quality parameters. Published reports for each area of the state are produced following each sampling event.

Examples of targeted research-oriented monitoring include investigation of pesticides in ground water in eastern Arkansas, nutrient and bacteria transport in shallow aquifer systems in northwest Arkansas, and salt-water intrusion into shallow aquifers in south-eastern Arkansas. Non-point sources of pollutants, although regional in scope, generally result in low level contamination below established health standards. Point-source or site-specific sources result in higher levels of contamination but are restricted to smaller areas (commonly on site boundaries). Program personnel work together with other divisions of the Department and other agencies in crafting guidelines and regulations to address both point-source and non-point sources of pollution. Although the state does not have a formal set of ground-water standards, the Water Division uses federal standards and health advisory limits to establish cleanup levels at contaminated sites.

III. Arkansas' NPS Approach To Address The Nine Key Elements

In view of the progress achieved in controlling point sources and the growing national awareness of the increasingly dominant influence of nonpoint source pollution on water quality, Congress amended the Clean Water Act in 1987 to focus greater national efforts on nonpoint sources. Congress enacted Section 319 of the Clean Water Act, establishing a national program to control nonpoint sources of water pollution. Under

section 319, states address nonpoint pollution by assessing nonpoint source pollution problems and causes within the state, adopting management programs to control the nonpoint source pollution, and implementing their management programs. Section 319 authorizes EPA to issue grants to states to assist them in implementing those management programs or portions of management programs, which have been approved by EPA. Section 319(h) directs states to develop nonpoint source pollution programs.

EPA issued guidance for Section 319(h) in May 1996. Arkansas developed the current NPS Management Program based on this guidance. On October 23, 2003, EPA published a new guidance for implementation of Section 319(h) that builds on and replaces all previous guidance. The new guidance gives direction for nonpoint source management programs, including the nine key elements that state nonpoint source management programs must address, which are discussed below.

Element #1

Explicit short- and long-term goals, objectives and strategies to protect surface and ground water

The ultimate, long-term goal of the NPS Management Program is to restore designated uses to water bodies identified as impaired by the Arkansas Department of Environmental Quality and to prevent water bodies that are threatened due to changing or intensifying land uses from becoming impaired.

Arkansas has made substantial progress to protect water quality. Many point sources have been or are being addressed. However, nonpoint source pollution remains a special concern because it is often difficult (and expensive) to determine specific sources and causes; management measures are "voluntary," and funding and other resources are insufficient to address problems holistically.

A. Program Strategies

1. **Pollution Prevention and Source Reduction.** Nonpoint source pollution is a significant contributor to the impairment of Arkansas' water bodies. It represents the dominant fraction of surface water pollution to lakes, streams, and rivers. Reducing nonpoint source pollution is complex and involves a large number of stakeholders representing important sectors of the economy taking voluntary coordinated action to implement best management practices over a sustained period of time. Moreover, the amount and distribution of nonpoint source pollution is also highly variable in both time and space as land use patterns and shifts in population result in increasing and changing nonpoint source stressors upon limited natural resources and land.

As a result, Arkansas' nonpoint source management measures and programs will focus for the most part on "*pollution prevention*" or "*source reduction*." Regardless of the pollution "source" (e.g., agriculture, silviculture, resource extraction, surface erosion, or households and business activities) or the cause (e.g., sediment, nutrients, pathogens, pesticides, pathogens, etc.), the Arkansas NPS Management

Program supports cost-effective and environmentally protective management practices that efficiently reduce or abate runoff of the targeted pollutant.

2. **Watershed-Based Implementation.** Limited funds make it impossible to effectively manage all causes of nonpoint source pollution from all sources in all watersheds of the state. Arkansas will focus watershed implementation on priority 8-digit hydrologic unit code watersheds where there are known impairments or significant threats to water quality from present and future activities. Only watersheds selected as priority watersheds will be eligible for section 319(h) funding from EPA "incremental funds." In addition, the ANRC will encourage other state agencies to target their efforts towards these same watersheds. To further focus limited resources to achieve measurable results, Arkansas will give preference to implementation projects that focus on sub-watersheds within identified priority watersheds.
3. **A Voluntary Program.** Arkansas' NPS Management Program promotes voluntary action to improve water quality. Unlike point source pollution, which may be relatively easily identified, collected and treated, Arkansas primarily addresses nonpoint source pollution through citizen education and outreach coupled with voluntary adoption of practical and cost-effective best management practices. Best management practices are generally designed to allow for the continuation of everyday activities while reducing or preventing nonpoint source pollution.
4. **Building Local Capacity To Address Local Concerns.** Since the program's inception, watersheds where there are active resourceful watershed-based groups have been the most motivated to develop and implement watershed action plans. Given this, Arkansas helps build local capacity to address local concerns through watershed groups and watershed planning.

Since NPS pollution is primarily a "people problem," the Arkansas NPS program advocates building local capacity to effect changes by providing many and varied opportunities for volunteer involvement at the local level. When NPS problems do occur, it is generally because of a lack of knowledge or a perceptual problem. Although it is difficult at times to measure or quantify management program implementation "successes," especially short-term duration (1-5 years), citizen education, outreach, and involvement is - and will remain - a primary tool for all NPS Management Program endeavors in Arkansas.

B. Program-Wide Objectives

Objectives for specific statewide programs and priority watersheds are identified in Section 3 through Section 15. The objectives below apply to the overall NPS Management Program. Explicit short-term objectives for the next two years can be found in Appendix F. These short-term objectives will be monitored and updated annually from 2006-2010.

1. Continue to make available competitive grants on an annual basis for statewide programs and watershed-based implementation projects on an annual basis, giving emphasis to priority watersheds, consistent with goals and objectives in this plan
2. Give preference to implementation projects that target sub-watersheds, thus improving the opportunity to achieve measurable improvements in the timeframe of this update
3. Continue to focus on increasing implementation of best management practices and other related behavioral changes that have the cumulative effect of improving water quality
4. Continue to improve mechanisms for tracking and reporting implementation of best management practices
5. Continue to strengthen education, outreach and involvement activities to move individuals and businesses from awareness to advocacy (see model described below)
6. Update the Qualitative Risk Assessment Matrix every other year or within six months after the Arkansas Department of Environmental Quality publishes its 303(d) list, whichever comes first, to identify emerging priority watersheds. Present new and emerging needs to the NPS Management Program Task Force at its every other year review
7. Meet with the NPS Management Program Task Force every other year to review and update the NPS Management Program, including the list of priority watersheds
8. Continue to develop local capacity of watershed groups to effect behavioral change, giving emphasis to priority watersheds
9. Strengthen existing and develop new working partnerships among cooperating entities in order to better leverage limited resources available to improve water quality
10. Foster improved sharing of data, GIS layers, assessments, research and other analytic tools that will enable improved targeting of NPS resources by all cooperating entities
11. Promote and support strengthened cooperation at the state and local levels to more effectively and efficiently target and coordinate resources to improve water quality.

Element #2

A balanced approach that emphasizes both statewide nonpoint source programs and on-the ground management of individual watersheds where waters are impaired and threatened.

Watershed based implementation has been a goal of the nation's Nonpoint Source Management Program from its initiation. Section 319 of the Clean Water Act states, "A state shall, to the maximum extent practicable, develop and implement a management program under this subsection on a watershed-by-watershed basis" In 1997, EPA increased its commitment to watershed implementation with publication of "Picking up the Pace," which established policy to target risk by enhancing the TMDL program and improving identification of water impaired by nonpoint sources. Supplemental program guidance published the same year stated, "[State's are to use] a balanced approach that

emphasizes both state-wide nonpoint source programs and on-the ground management of individual watersheds where waters are impaired or threatened." In 1997, Congress made incremental additional funds available to the states to implement projects that address identified water quality impairments.

Since 1997, EPA has strengthened its commitment to use the incremental funds for restoration of impaired waters. Supplemental guidance published in 2003 for section 319(h) grants states, "The priority objective for the use of Section 319 grant funds is to implement the national policy, set forth in section 101(a) of the Clean Water Act (CWA), that nonpoint source programs be implemented expeditiously to achieve the goals of the CWA, including the restoration and maintenance of the chemical, physical, and biological integrity of the nation's waters."

To achieve this objective, the guidance places top priority on implementing on-the-ground measures and practices that will reduce pollutant loads and contribute to the restoration of impaired waters. The approaches described below achieve balance between statewide programs and watershed-based implementation projects and address the CWA objectives by directing the use of incremental Section 319 funds for the development and implementation of watershed-based plans that are designed to restore waters that ADEQ has listed as impaired under Section 303(d) of the Clean Water Act

Statewide Programs

Arkansas' 2006-2010 NPS Management Program balances statewide programs focused on specific land uses with watershed-based projects that seek to restore designated uses or prevent waters from becoming impaired. Statewide programs will be implemented in the following areas:

Table 1.1: Statewide Programs

Section	Statewide Program
4	Agriculture, including row crop agriculture and animal agriculture
5	Silviculture
6	Resource Extraction
7	Surface Erosion, including construction, hydrologic modification, and roads
8	Household and Business Activities, including urban

Statewide programs have been redefined for the 2006-2010 Update in discussion with the Arkansas Department of Environmental Quality to more effectively integrate program responsibilities between the lead agencies. The new Surface Erosion statewide program corresponds to a new source of impairment defined in ADEQ's 2004 draft inventory of impaired water bodies. Table 1.2 identifies the lead agencies for each statewide program.

Table 1.2: Lead Agencies With Primary Responsibility For Statewide Programs

	Agriculture	Silviculture	Resource Extraction	Surface Erosion	Household & Business Activities
Arkansas Natural Resources Commission	Lead			Lead	Lead
Arkansas Department of Environmental Quality			Lead		
Arkansas Forestry Commission		Lead			
Arkansas Department of Health					Lead

Each statewide program section (Sections 4-8) includes a list of potential pollutants, program goals, objectives and milestones, a brief summary of the institutional context, a discussion of federal consistency, and best management practices.

Priority Watershed Programs

Arkansas has emphasized watershed-based management in its nonpoint source pollution management program since 1998. In 1998, the Illinois River, Kings River, Yocum and Longs Creeks, Buffalo River, Big Piney Creek, Poteau River, Cossatot River, Smackover Creek and Bayou Bartholomew were identified as priority watersheds for program implementation (ANRC 1999). These priorities have since been updated to include streams identified in Arkansas Unified Watershed Assessment and those watersheds in which TMDLs have been developed.

Arkansas will continue to treat all watersheds with nonpoint source total maximum daily loads (TMDLs), excluding mercury only TMDLs, as priority waters for 319(h) funding. Table 1.3 lists stream names with TMDLs, the number of affected reaches, and whether nonpoint source pollution contributes to the impairment.

Table 1.3: Finalized TMDLs, 2004

Stream Name	#of Reaches w/ TMDL	Pollutant	Source
Bayou Bartholomew	6	Siltation	Nonpoint
L'Anguille River	5	Siltation	Nonpoint
L'Anguille River	2	Pathogens	Nonpoint
Deep Bayou	1	Siltation	Nonpoint
Hicks Creek	1	Nitrates	Point
Holman Creek	1	Nitrates	Point
Whig Creek	1	Nitrates	Point
Elecc Tributary	1	Ammonia	Point & Nonpoint
Elecc Tributary	1	Chlorides	Point & Nonpoint
Elecc Tributary	1	Sulfates	Point & Nonpoint
Elecc Tributary	1	TDS	Point & Nonpoint
Various watersheds	33	Mercury	

To identify additional priority watersheds for the 2006-2010 Update, the NPS Management Program employed a qualitative risk assessment matrix to prioritize 8-digit

watersheds eligible for incremental funds. As a starting point for the assessment, a literature review of impaired water bodies was conducted (Appendix A). While the assessment looks at all watersheds in the state, watersheds with reaches on the state's 303(d) inventory of impaired waters are given the most weight. The NPS Management Program Task Force identified nine additional parameters to be considered and a scoring system for each parameter. Based on the resulting scores, watersheds were grouped into quintiles. Appendix B describes the qualitative risk assessment matrix in more detail. ANRC designated eight priority 8-digit HUC watersheds from the top quintile, which are listed below. Table 1.4 lists priority watersheds and identifies those with NPS-related TMDLs. Figure 1.13 shows the location of priority watersheds.

Table 1.4: Priority Watershed Programs, 2005

Section	Priority Watershed	Non-Mercury TMDL ¹
8	Bayou Bartholomew	X
9	Illinois River	
10	L'Anguille River	X
11	Lake Conway-Point Remove	
12	Lower Little River	
13	Poteau River	
14	Upper Saline River	
15	Upper White River	

Figure 1.13: Location of Priority Watersheds

<http://baeg.uark.edu/wml/files/nps-maps/04-120-priority-watersheds.jpg>

Source: Department of Biological and Agricultural Engineering, University of Arkansas

Targeted Implementation

Water quality protection efforts can be better targeted using inclusive stakeholder-developed plans and strategies to achieve shared goals and objectives. However, development and "adoption" of well-designed watershed protection plans continue to be impediments to state and local efforts to protect water quality. Limited availability of staff and other resources to effect long-term, self-sustaining watershed protection

efforts, develop watershed protection plans, and efficiently identify and target best management practices and other management measures for site-specific NPS pollutant sources and causes are program constraints. Substantial effort and resources will be expended to develop and implement nine element plans for these priority watersheds with clearly stated, achievable, and measurable goals and objectives. Table 2.2 in the program description shows the status of development of nine element plans.

Funding through the EPA and other programs is not likely to be sufficient to fully treat any 8 digit HUC watershed. Therefore, the State will target its efforts toward sub-watersheds within identified priority 8 digit HUC watersheds. Only watersheds selected as priority watersheds will be eligible for section 319(h) funding from EPA "incremental funds." In addition, the ANRC will encourage other state agencies to target their efforts towards these same watersheds.

Implementation projects that focus on sub-watersheds where there is demonstrated potential for measurable results in the short run will be given preference for watershed implementation grants. The program description in Section 2 includes a detailed description of how sub-watershed priorities will be reviewed.

Watersheds not designated as priority watersheds are not excluded from funding under the 319(h) grant program. They are restricted to competing for the non-incremental funds, which comprise 57% of the total funding.

Element #3

Strong working partnerships with appropriate state, Tribal, regional, and local entities, private sector groups, citizens groups, and Federal agencies.

The Arkansas Natural Resource Commission (ANRC) has been the lead agency responsible for Arkansas' Nonpoint Pollution Management Program since 1990. ANRC has made it a priority to develop strong working partnerships with appropriate state and federal agencies, regional and local entities, nonprofit organizations and watershed groups. In addition, ANRC works closely with industry associations and other private sector groups to promote implementation of voluntary best management practices.

State, federal and local agencies along with state, regional and local associations, nonprofit organizations and watershed groups will cooperate to provide education, outreach, technical assistance, cost share and other programs targeted to one or more sources or pollutants. More than 100 cooperating entities have responsibility for addressing nonpoint source pollution in Arkansas.

The process of preparing this 2006-2010 Update reflects a strengthened commitment to cooperation as compared to previous plans and provides a mechanism for regular review and updates to the plan. The ANRC invited more than 225 individuals and organizations with an interest in nonpoint source pollution to appoint a representative to the NPS Management Program Task Force. The task force met four times with more than 75 participants attending the three planned meetings and more than 50 attending an additional meeting. A total of 140 individuals representing 79 different organizations

participated in one or more task force meetings. In addition, more than 75 individuals participated in 33 individual and small group meetings.

This cooperative process has already led to increased cooperation. As a result of these discussions, for example, there is growing interest and emerging examples among cooperating entities to develop mechanisms to more easily share data, GIS layers, assessments and other information that enables improved targeting of resources. The challenge for resource agencies, policy makers, and citizens is to cooperatively implement NPS management measures successfully, while concurrently finding ways to integrate new, unique or emerging needs and programs.

Section 3, Cooperating Entities, describes entities that are working together to manage NPS pollution in Arkansas. Appendix D describes in more detail how the NPS Management Program Task Force was created and its role in the planning process. The adaptive management discussion below describes how the NPS Management Program Task Force will be used for regular review and update of this plan.

Element #4

The state program (a) abates water quality impairments from existing sources and (b) prevents significant threats to water quality from present and future activities.

The Arkansas Department of Environmental Quality is responsible for monitoring and assessing water quality. The Arkansas NPS Management Program, administered by the Arkansas Natural Resource Commission, utilizes the Water Quality Assessment Report [section 305(b)] and Inventory of Impaired Water Bodies [section 303(d)] as the basis for information to determine if water bodies are affected by nonpoint pollution. Both evaluative data and monitored data have historically been utilized to assist in making this determination. Figure 1.10 illustrates the watersheds which were included in the state's draft section 303(d) list for 2004.

The Arkansas Nonpoint Source Management Program is directed at abatement of known water quality problems as identified in the section 305(b) assessment report and 303(d) inventory of impaired water bodies and significant threats to water quality from present and future activities. Statewide programs are developed to prevent and address the different causes of impairment and their sources for abatement activities. Specific action plans are developed for priority watersheds with nonpoint source pollution caused impairment. These plans will be consistent with all existing watershed management and water quality management plans. The State NPS Management Program is reviewed on a biennial basis by the NPS Management Program Task Force and can be modified to address new problems as they arise.

Element #5

An identification of waters and watersheds impaired or threatened by nonpoint source pollution and a process to progressively address these waters.

The Arkansas Department of Environmental Quality's Nonpoint Inventory of Impaired Water Bodies lists waters not supporting all designated uses and identifies the most likely source of pollution and causes for the impairment. The inventory is based on monitoring and evaluative data collected by ADEQ as well as data from other sources if the data meets EPA specifications. The state NPS Program uses this assessment report as a guide in developing action plans for statewide programs and for identifying priority watersheds for special assistance.

Once a watershed is identified as a priority watershed for the purposes of the NPS Management Program, it is identified for further assessment work and development of a nine element plan involving local watershed group(s) with support from state and federal agencies and other cooperating entities. As appropriate, SWAT modeling or other watershed analysis of nonpoint sources is initiated and action plans developed for addressing water quality conservation needs of the watershed. Appendix C describes SWAT analysis. BMP implementation in priority watersheds will be monitored to the extent possible given confidentiality requirements enacted by Congress in the 2002 Farm Bill. BMP monitoring together with ongoing water quality and environmental monitoring can be used to determine the effectiveness of the watershed action plans. Evaluation and revision of the action plans will be conducted by local planning and technical support partners on a regular basis.

Element #6

The state reviews, upgrades and implements all program components required by section 319 of the Clean Water Act, and establishes flexible, targeted, iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable. The state programs include: (a) A mix of water quality-based and/or technology-based programs designed to achieve and maintain beneficial uses of water; and (b) A mix of regulatory, non-regulatory, financial and technical assistance as needed to achieve and maintain beneficial uses of water as expeditiously as practicable.

Arkansas's NPS Management Program utilizes a voluntary approach to achieve and maintain designated uses. To promote voluntary effort, the Arkansas NPS Management Program makes available competitive grants to eligible public agencies, universities and nonprofit organizations on an annual basis for statewide programs and watershed-based implementation projects on an annual basis. The grants program is described in Section 2 of this update.

As the lead agency, ANRC prepares an annual report that documents the state's implementation of the NPS Management Program. The annual reporting process is described in Section 2 of this update. In addition to meeting Clean Water Act reporting requirements, the annual report will be used to communicate program status to the NPS Management Program Task Force, thus enabling the task force to participate in evaluating programs and recommending mid course corrections to the NPS Management Program on an ongoing basis.

Arkansas will employ an adaptive management approach to keep the NPS Management Program Update current. The role of the NPS Management Task Force in the adaptive

management process is described in Section 2. For all statewide and priority watershed programs, the overall program strategy is to promote voluntary best management practices using a cooperative process whereby federal and state programs cooperate in priority areas of the state, where water quality problems have been identified. As long as voluntary implementation of best management practices and cooperative processes result in the incremental reduction of nonpoint source pollutant loads, it will be viewed as successful. However, if the voluntary, cooperative process does not result in the incremental reduction of nonpoint source pollution and/or water quality improvements, then state and local entities will need to investigate additional cost-effective steps needed to enable water bodies to meet their designated uses over the long term.

Element #7

Efficient and effective management and implementation of the State's nonpoint source program, including necessary financial management.

Efficiency and effectiveness are achieved in the following ways.

- The NPS Management Task Force will review the NPS Management Program on a biennial basis. Through review of the program, progress toward achieving milestones reported in annual reports, the task force will provide independent assurance that NPS Management Program funds are used effectively, are targeted toward state priorities, and truly address NPS issues affecting the waters of Arkansas.
- Many agencies represented on the task force also are represented on various other state and federal committees and task forces, such as the EQIP Technical Committee or the Multi-Agency Wetlands Protection Team. This cross representation promotes greater coordination and leveraging of limited funds to more adequately meet the needs of the NPS Management Program.
- Proposals for competitive grants that will use CWA Section 319(h) funds are reviewed and ranked by a peer review committee representative of cooperating entities. The advisory group discusses and recommends whether additional conditions should be added to grant awards in order to improve the cost-effectiveness of the approach or to better target the project to the stated objectives of the NPS Management Program.
- ANRC provides technical assistance to the agency, university or nonprofit organization that submitted the proposal to develop a detailed work plan that meets the needs of the proposing entity, the NPS Management Program and the requirements set by the Clean Water Act. This process helps shape projects so that they are more likely to achieve the intended results efficiently and effectively.
- ANRC follows Generally Accepted Accounting Principles (GAAP) guidelines issued by the Governmental Accounting Standards Board and undergoes an annual audit consistent with government audit standards laid out in various OMB and GAO guidance. Entities that expend Section 319(h) funds are subject to audit requirements that assure compliance with state and federal laws and regulations. This financial oversight provides both EPA and the public with confidence in the integrity of ANRC's financial management.

Element #8

Identification of Federal lands and objectives, which are not managed consistently with State program objectives.

A list of federal lands in the state is included in the update along with the agency responsible. ANRC will provide copies of this 2006-2010 Arkansas NPS Management Program Update to the director of each federal agency. The U.S. Forest Service (USFS) manages more federal lands in Arkansas than any other federal agency. The Arkansas Forestry Commission monitors and reports implementation of best management practices on USFS lands through a biennial survey.

Element #9

A feedback loop whereby the State reviews, evaluates, and revises its nonpoint source assessment and its management program at least every five years.

The current Arkansas NPS Management Program was developed in 1998 and updated in 2002. Experience has shown that the program needs to be updated on a regular basis in order to integrate new, unique or emerging needs and programs. The NPS Management Program Task Force was formed to develop the 2006-2010 Update. This task force will meet every other year to review the plan and recommend updates, starting in 2006. The goal is to update the plan incrementally every other year in order to avoid the need for major updates that are time-consuming and disruptive to ongoing effort.

The Qualitative Risk Assessment Matrix will be updated as soon as practical after each new 303(d) list is finalized. The NPS Management Program Task Force will consider the updated matrix at its next regularly scheduled meeting and make recommendations on changes to the list of priority watersheds. When the NPS Management Task Force reviews the 2006-2010 Update in 2006, they will be presented with the updated matrix that reflects the 2004 303(d) list. In the meantime, emerging needs will be watched closely in close coordination with NPS Management Program cooperating entities.

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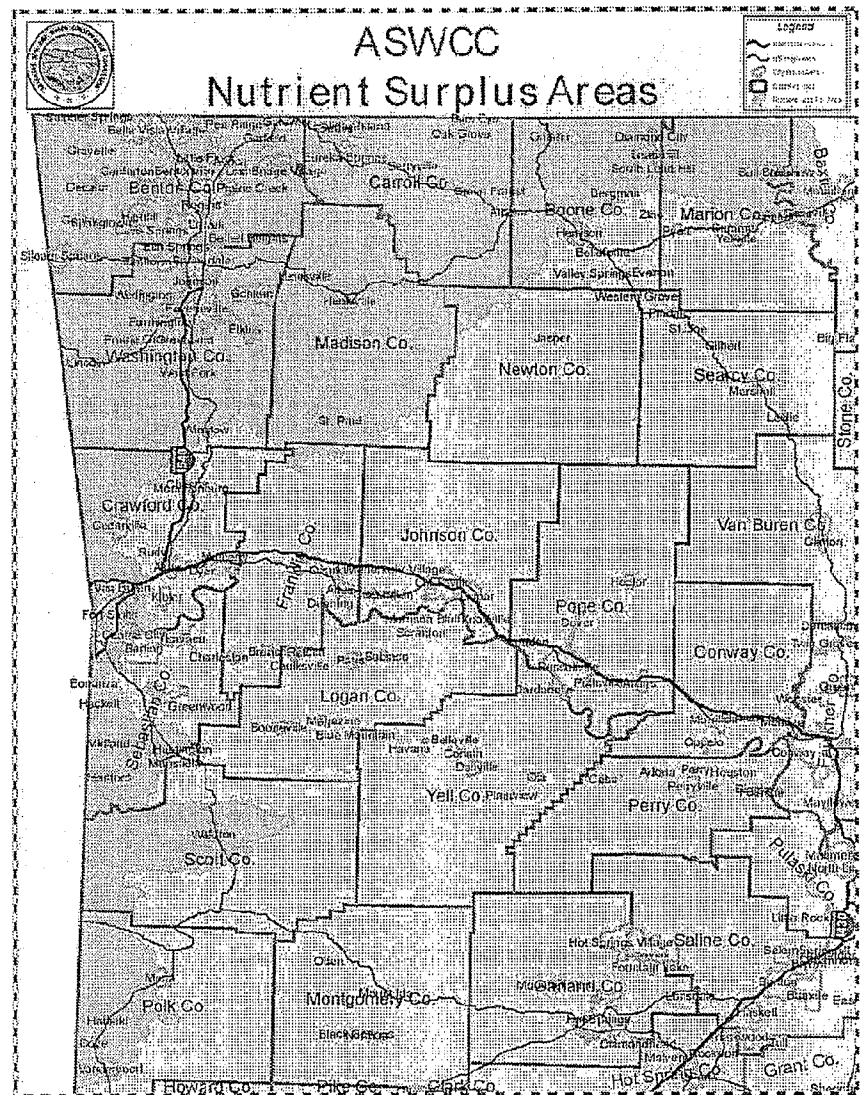
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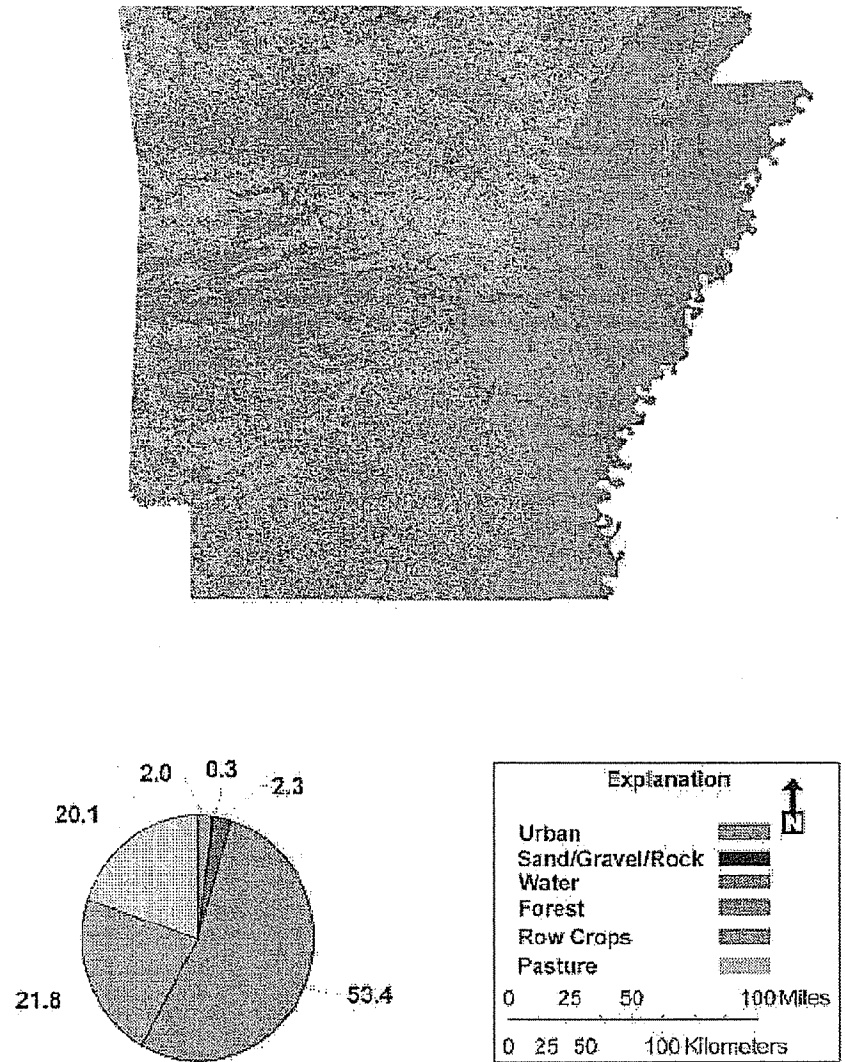
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Figure 1.1 Nutrient Surplus Areas



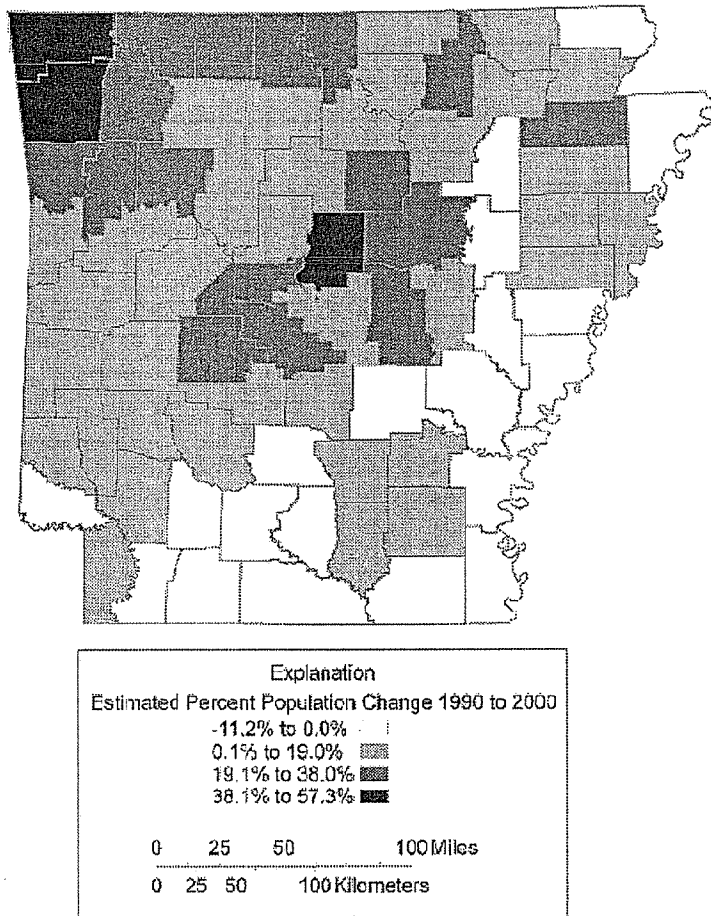
Source: Arkansas Natural Resources Commission

Figure 1.2 Arkansas Land Use, 1999



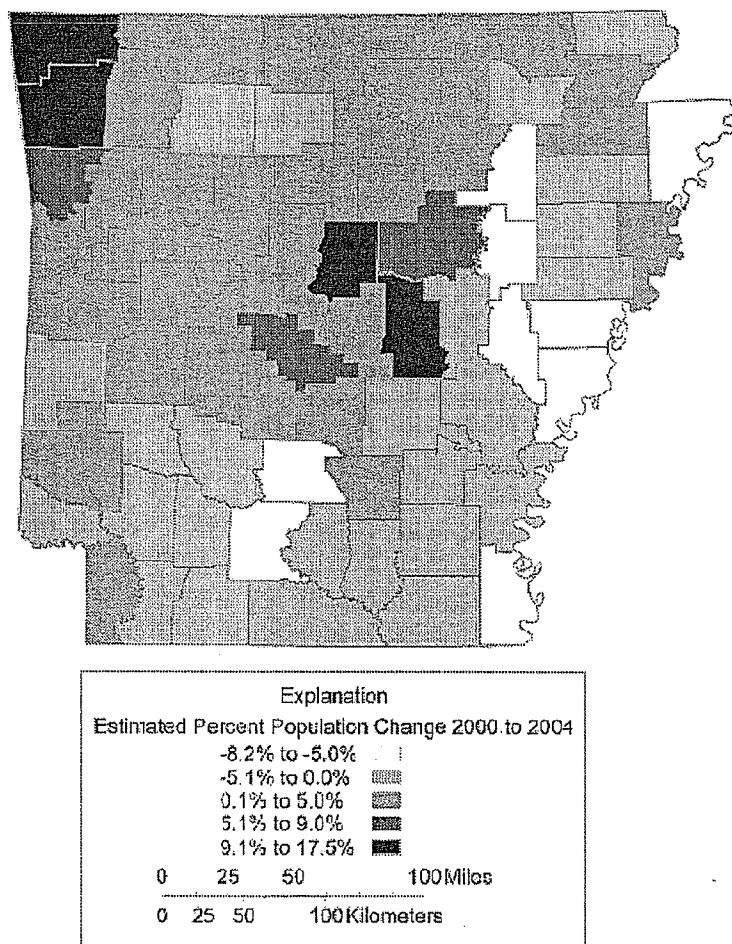
Source: Center for Advanced Spatial Technologies, Land Use-Land Cover, 1999

Figure 1.3 Population change, 1990-2000, Arkansas



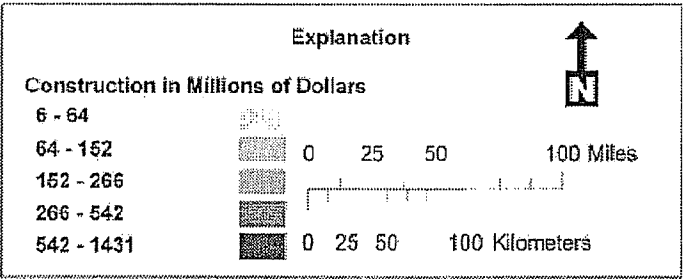
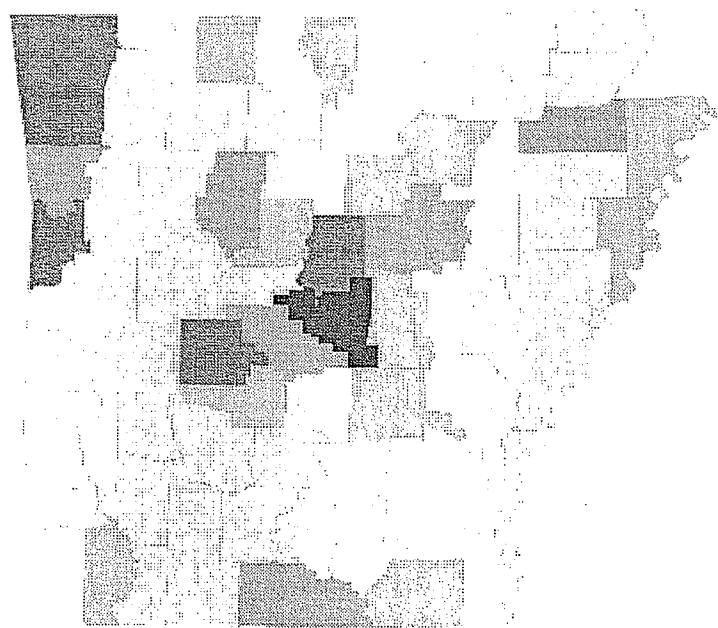
Source: University of Arkansas, Cooperative Extension Service, County Profiles, 2002.

Figure 1.4 Population Change 2000-2004, Arkansas



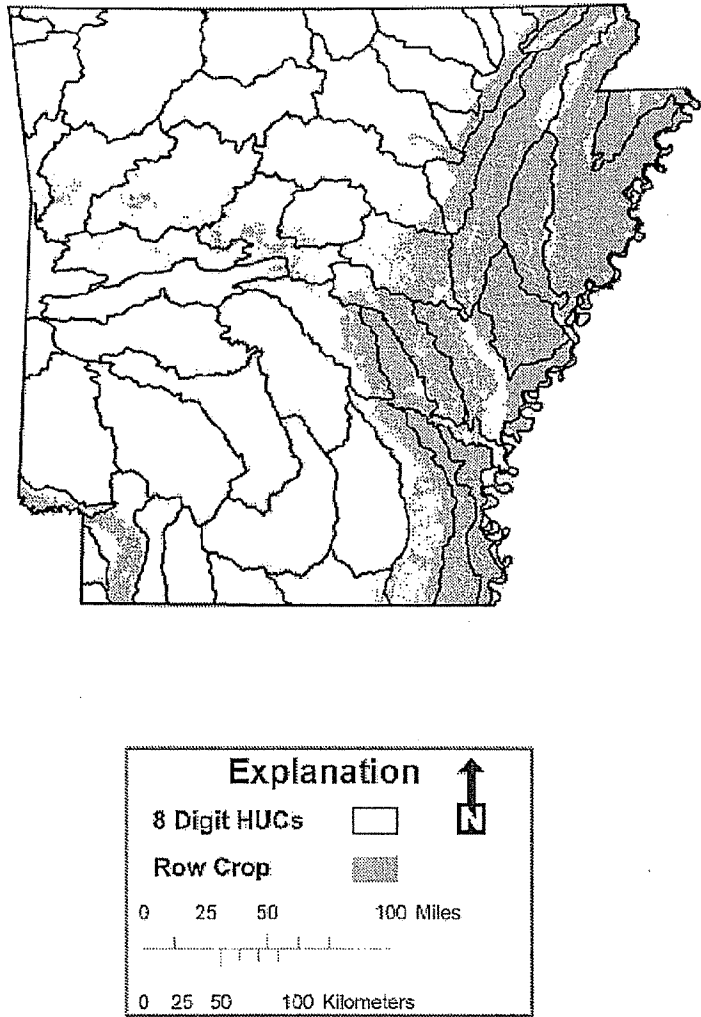
Source: University of Arkansas, Cooperative Extension Service, County Profiles, 2002.

Figure 1.5 Value of Arkansas Construction in Millions of Dollars By County, 2002



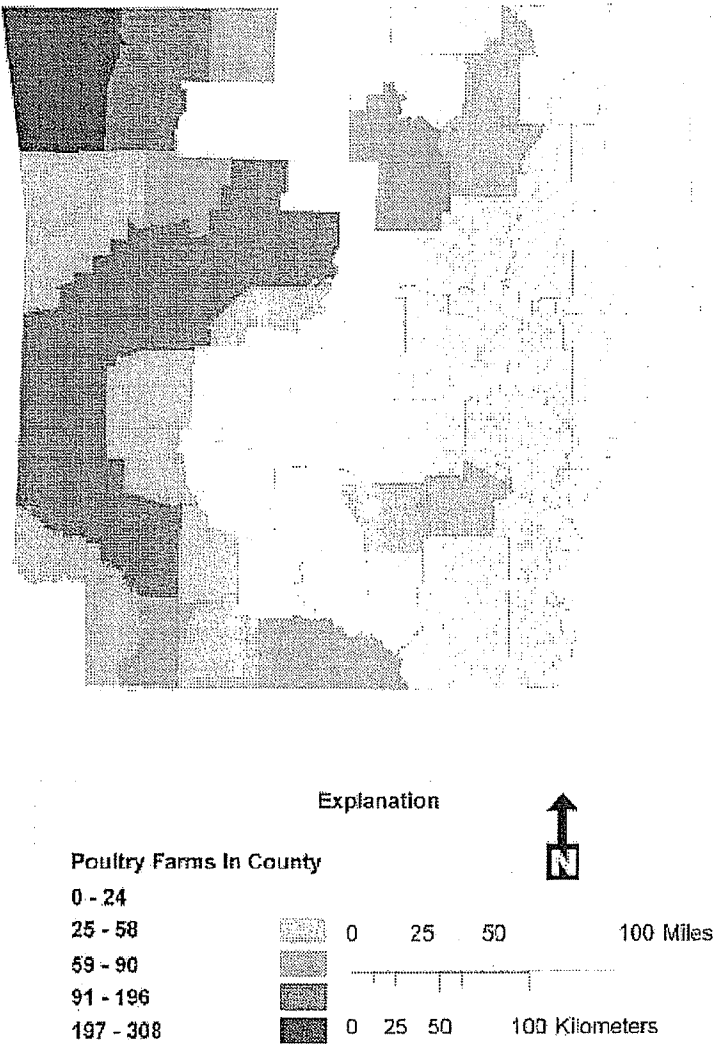
Source: Bureau of Economic Analysis

Figure 1.6 Arkansas Cropland, 1999



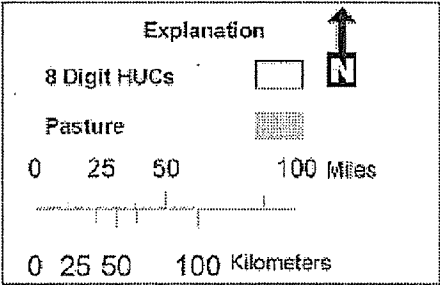
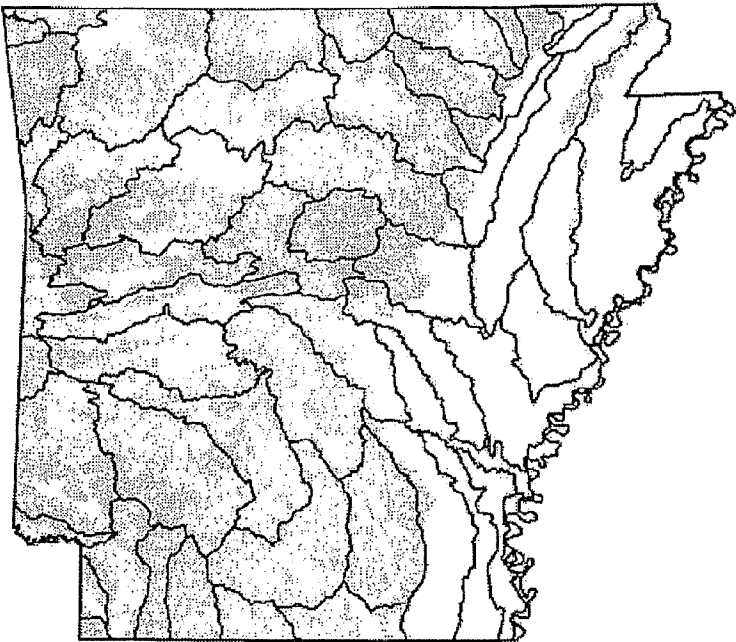
Source: Center for Advanced Spatial Technologies, Land Use-Land Cover, 1999

Figure 1.7 Arkansas Poultry Production, 2002



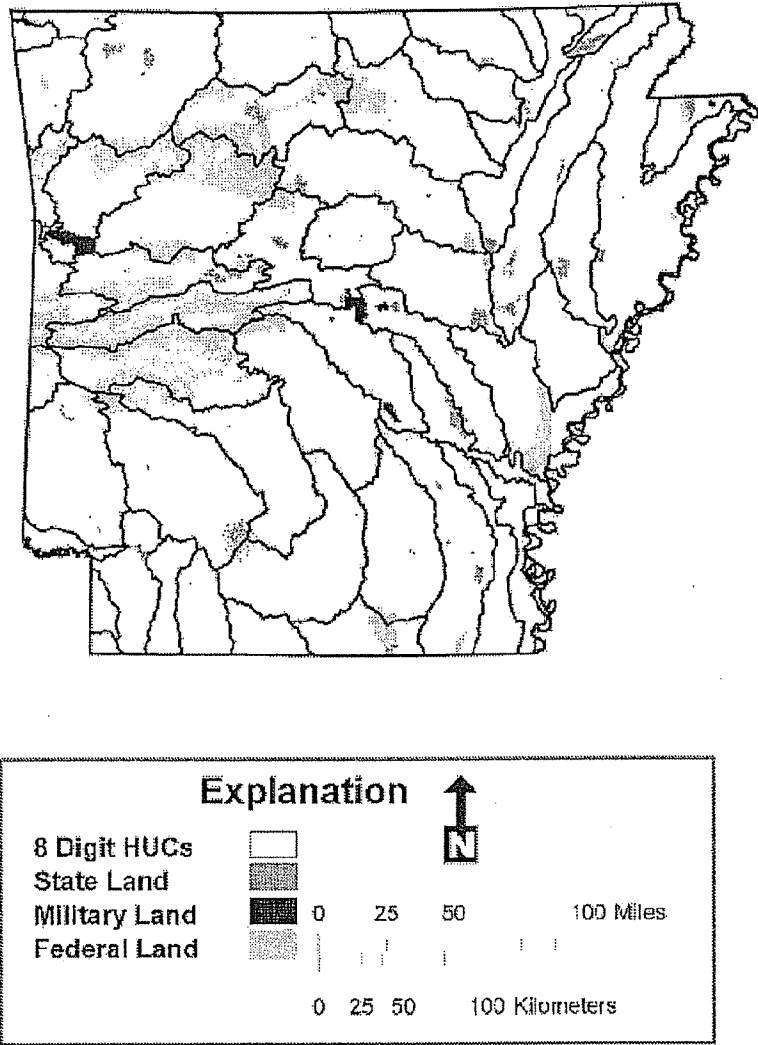
Source: USDA National Agricultural Statistics Service, Census of Agriculture, 2002

Figure 1.8 Arkansas Pastureland, 2002



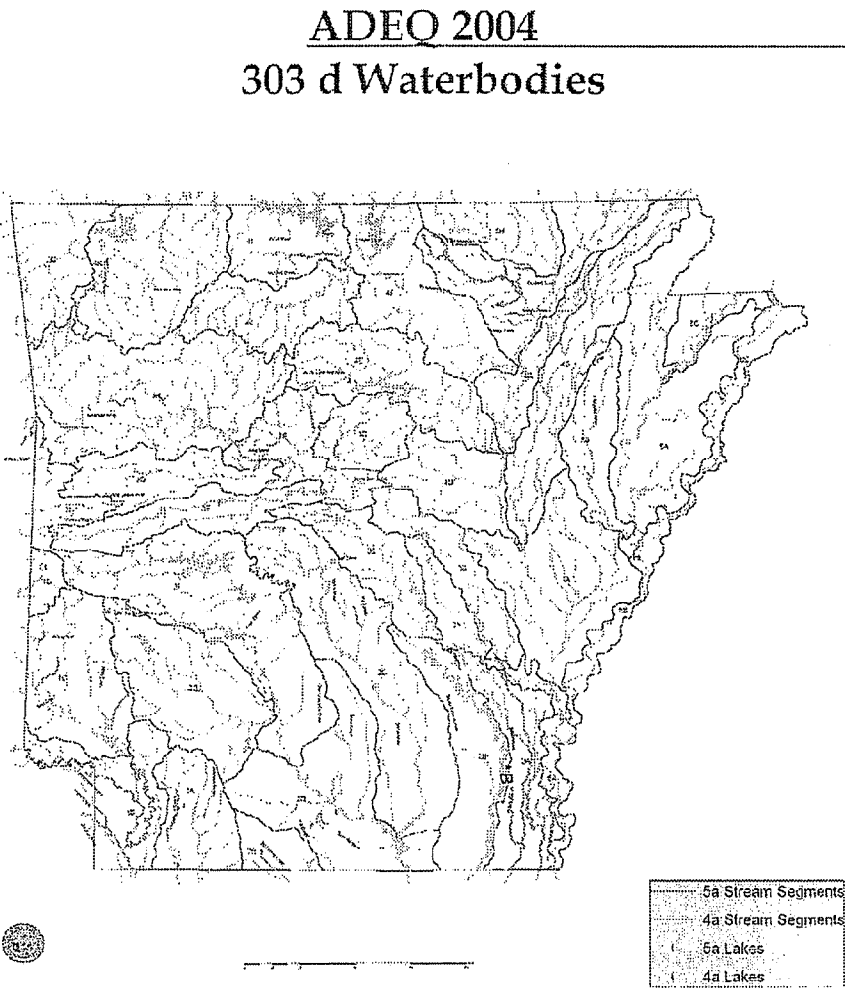
Source: Center for Advanced Spatial Technologies, Land Use-Land Cover, 1999

Figure 1.9 Public Lands in Arkansas



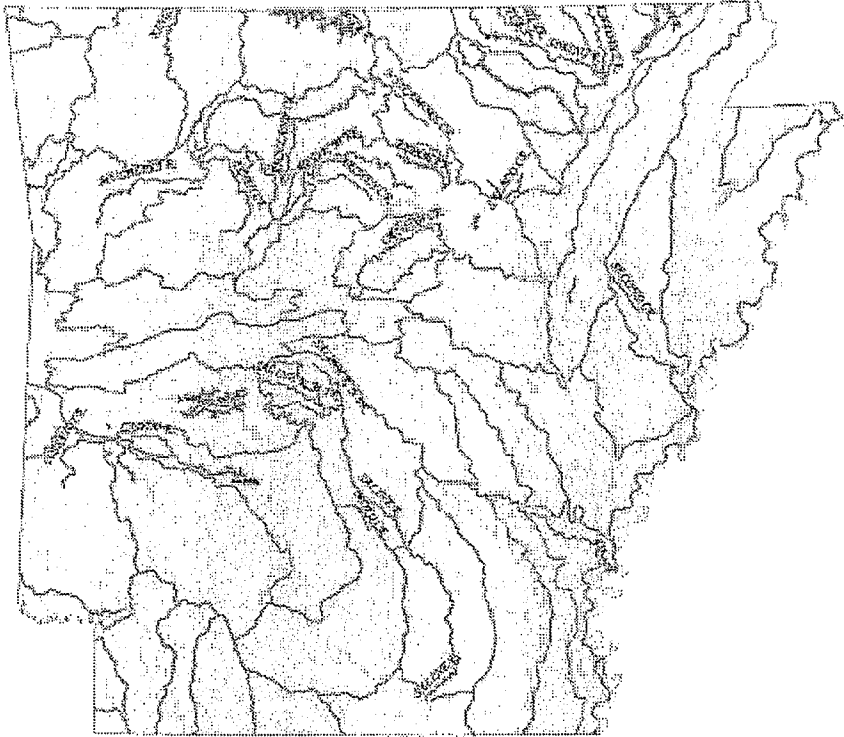
Source: U.S. Geological Survey

Figure 1.10 2004 Draft Arkansas Inventory of Impaired Water Bodies



Source: Arkansas Department of Environmental Quality

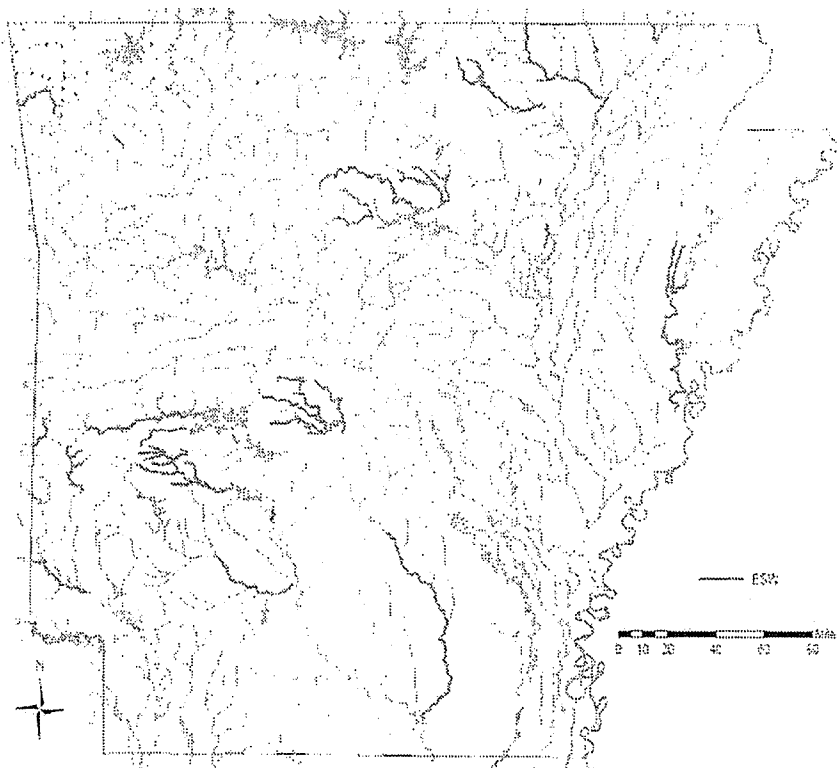
Figure 1.11 Arkansas Extraordinary Resource Waters



Archey Fork, Arkansas River (below Dam #2), Beech Fork, Big Creek, Big Fork Creek, Buffalo River, Bull Shoals Reservoir, Cache River, Caddo River; Caddo River, South Fork; Cadron Creek; Cadron Creek, East Fork; Cadron Creek, North Fork; Caney Creek; Cossatot River; Current River; Cut Creek; De Gray Reservoir; Devils Fork; Eleven Point River; English Creek; Falling Water Creek; Field Creek; Hurricane Creek; Illinois Bayou; Illinois Bayou, East Fork; Illinois Bayou, Middle Fork; Illinois Bayou, North Fork; Kings River; Lake Ouachita; Lee Creek; Lick Creek; Little Missouri River; Moro Creek; Mountain Fork River; Mulberry River; Myatt Creek; North Sycamore Creek; Ouachita River; Ouachita River, Irons Fork; Piney Creek; Raccoon Creek; Red River, Middle Fork; Richland Creek; Salado Creek; Saline River; Saline River, Alum Fork; Saline River, Middle Fork; Saline River, North Fork; Saline River, South Fork; Second Creek; Spring River; Spring River, South Fork; Strawberry River; Tomahawk Creek; Two Prairie Bayou; Turkey Creek; White River, Little North Fork

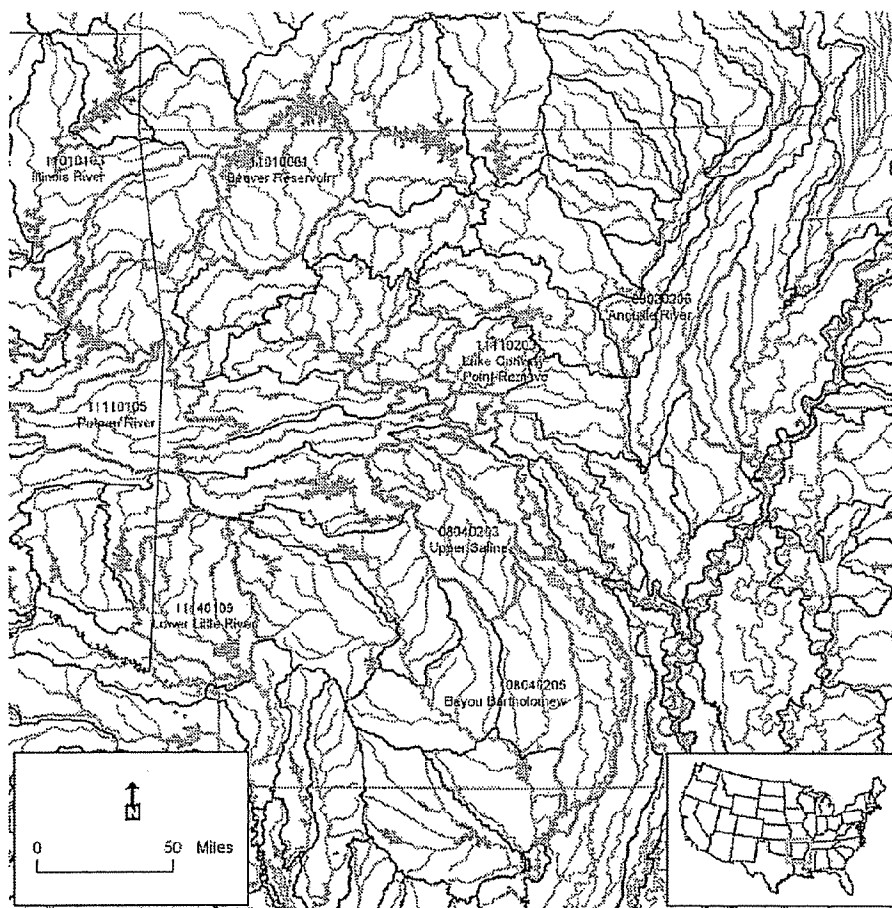
Source: Arkansas Department of Environmental Quality

Figure 1.12 Arkansas Ecologically Sensitive Waters



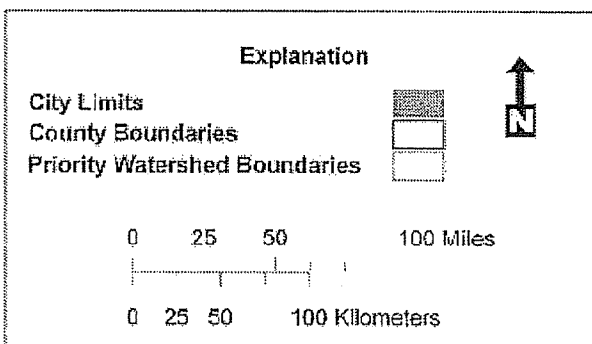
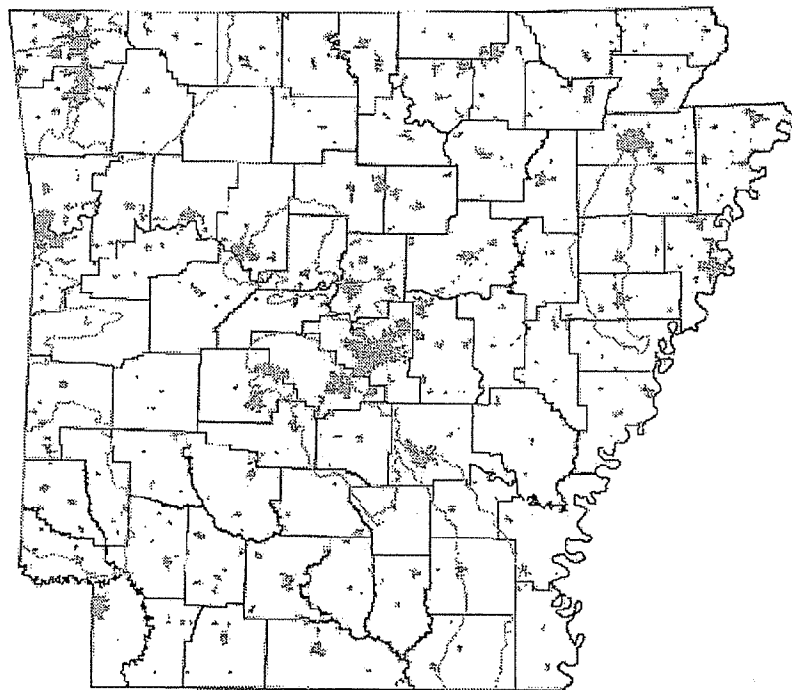
Source: Arkansas Department of Environmental Quality

Figure 1.13a Arkansas Location of 8-digit HUC Priority Watersheds by watershed



Source: Arkansas Natural Resources Commission

Figure 1.13b Arkansas Location of 8-digit HUC Priority Watersheds by county



Source: University of Arkansas, Department of Agricultural and Biological Engineering, 2005

*Section Ten***Illinois River Watershed**

Priority Watershed

**2006-2010 Nonpoint Source Pollution Management Update
A portion of ADEQ planning Segment 3J ♦ Hydrologic Unit Code 11110103**

The Illinois River Watershed contains approximately 1.1 million acres of which approximately 493,500 acres (46%) are in Arkansas and approximately 576,000 acres (54%) are in Oklahoma. The Illinois River Watershed portion of segment 3J (HUC 11110103) occupies the northwestern corner of Arkansas and covers part of Benton County, a large part of Washington County and a small section of Crawford County. This segment includes the Illinois River and its tributaries within Arkansas. The main tributaries in Arkansas are Osage Creek, Flint Creek and Spring Creek.

Figure 10.1: Map of the Illinois River Watershed

<http://baeq.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-cover.jpg>

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

Assessment

All waters within this segment have been designated as suitable for the propagation of fish and wildlife, primary and secondary contact recreation as well as public, industrial and agricultural water supplies (APCEC, 2001). The Illinois River Watershed portion of segment 3J contains 152 stream miles in which 125.1 stream miles were monitored at eight permanent monitoring stations. An additional 8.1 stream miles were evaluated for a total 133.2 stream miles monitored in the Illinois River watershed. Nonpoint source impacts affecting waters in this segment are primarily from pasture land that is also used for application of poultry litter as fertilizer. In addition, many activities contribute to the destabilization of the streambed and excessive bank erosion, including in-stream gravel removal, conversion of forest to pasture and removal of riparian buffers for construction and other activities. Road construction and maintenance is also contributing to siltation problems.

Table 10.1 summarizes studies that have found impaired reaches of the Illinois River and its tributaries. In addition, nutrient enrichment of the water bodies in this watershed is a concern, both from point and nonpoint sources. Known problems below wastewater treatment facilities do occur and are easily documented. However, detecting and determining the extent of impacts of the contributions of nutrients from nonpoint sources is difficult. Land use in the watershed is probably the best indicator of where nutrients have the greatest potential to impact water quality. Potentially, confined animal operations in high concentrations within a watershed can result in application of animal manures at nutrient rates greater than can be assimilated, resulting in the nutrients being transported into adjacent streams during storm events.

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10.1

In addition, improper management techniques of the nutrients can also result in adjacent streams receiving nutrient inputs during storm events.

U.S. Geological Survey (USGS) and the Arkansas Natural Resources Commission (ANRC) cooperated on a project to collect and analyze water quality samples to estimate nutrient loads for nitrogen and phosphorus for 1997-1999 using regression analysis. Total estimated phosphorus and nitrogen annual loads for calendar year 1997-1999 using the regression techniques on 35 samples were similar to estimated loads derived from integration techniques on 1,033 samples. Nitrogen and phosphorus estimates were higher than for comparable undeveloped watersheds (Green and Haggard, 2001).

Arkansas Department of Environmental Quality (ADEQ) surveyed macroinvertebrate and fish communities in the Illinois River in 1995-1996 to assess the impact of municipal wastewater treatment facilities on water quality and aquatic life communities. In addition, the study characterized the effects of point source and nonpoint source pollution on seasonal water quality (ADEQ, 1997). USGS collected periphyton samples at 51 stream sites in the Ozark Plateaus to determine the effect of different land uses. Results indicate that periphyton communities are affected by natural and land-use related factors, including nutrients, dissolved organic carbon, alkalinity, canopy shading, suspended sediment, embeddedness, stream morphometry, and velocity (Peterson and Femmer, 2002).

The Natural Resources Conservation Service (NRCS) and U.S. Forest Service (USFS) completed a Cooperative River Watershed study for the Illinois River and published its Resource Base Report. The study found the Illinois River and many of the lakes on its tributaries were eutrophic from excessive nutrients (USFS and NRCS, 1992).

The Arkansas Water Resources Center (AWRC) prioritized sub-basins in the watershed in 1996 based on total phosphorus, total nitrogen and total suspended solids. Each sub-basin was given a low, medium or high prioritization for each of the three factors (AWRC, 1996).

A USFS comparative assessment of 50 watersheds in Arkansas and Oklahoma estimates potential erosion by land use for the Illinois River watershed. Based on 1992 National Resource Inventory (NRI) data, pasture land had the highest potential erosion rate at 72% compared to other lands (including urban) with a 15% potential erosion rate and forestry with a 2% potential erosion rate. Compared to 1982, potential erosion rates increased for pasturelands and decreased for other lands (USFS, 1999).

USGS has done extensive monitoring and analysis of surface and ground water quality in the Ozark Plateau study area as part of the National Water Quality Assessment Program (NAWQA). Major findings for the Ozark Plateau study area are available at: <http://ar.water.usgs.gov/nawqa/ozark/findings.html>.

Under contract with the Arkansas Natural Resources Commission (ANRC), the University of Arkansas Department of Biological and Agricultural Engineering, is using the soil and water assessment tool (SWAT) to model priority watersheds for the 2006-2010 NPS Management Program. Figure 10.2 uses SWAT estimates of sediment, run-off and

nutrient loads for phosphorus and nitrogen for some sub-watersheds in the Illinois River watershed to show the relative loading in quintiles for each sub-watershed, which roughly approximates the area of a 14-digit Hydrologic Unit Code area.

Figure 10.2: Relative estimates of contribution of Illinois River sub-watersheds to total estimated sediment, runoff and nutrient loads for phosphorus and nitrogen using SWAT

<http://baeq.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-flow.jpg>
<http://baeq.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-sediment.jpg>
<http://baeq.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-total-n.jpg>
<http://baeq.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-percentiles-total-p.jpg>

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

Table 10.1: Review of Impaired Reaches, Illinois River Watershed

Reach Name	Seg	Impairment	Impacts	Cause	Source	Comments
Clear Creek	029	Primary Contact (ADEQ, 2005)		Pathogens (ADEQ, 2005)	Urban Runoff (ADEQ, 2005)	
Clear Creek, Mud Creek	029	Aquatic Life (ADEQ, 2005 and 1997)		Siltation and Turbidity	Agriculture & Urban Runoff (ADEQ, 2002)	
Muddy Fork	025		Aquatic Life (ADEQ, 1997)			
Illinois River	022, 023		Aquatic Life (ADEQ, 1997)	Habitat Limitations (ADEQ, 1997)		
Osage Creek	930		Aquatic Life (ADEQ, 1997)			Influenced by cold spring water (ADEQ, 1997)
Spring Creek	931		Aquatic Life (ADEQ, 1997)			Influenced by cold spring water (ADEQ, 1997)

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10.3

Brief Description of Land Uses That Can Impact Water Quality

Figure 10.3: Distribution of land uses in the Illinois River Watershed

http://baeq.uark.edu/wml/files/nps-maps/final-report/illinois/illinoisludraft_highres.jpg

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

The following provide a partial snapshot of land uses in the watershed:

- There are seven drinking water sites in the Arkansas and Oklahoma portions of watershed. (USFS, 1999)
- The population of Washington and Benton counties grew 47% from 1990 to 2000, an increase of more than 100,000 individuals. Washington and Benton counties have continued to grow at a rapid pace from 2000-2003. Benton County added 12.1% and Washington County added 7.6% from 2000-2003 (University of Arkansas, 2005). As a result, there is significant new construction, including residential, commercial and industrial, roads and other infrastructure. Construction can be found both within municipal boundaries and in rural areas of the watershed where onsite waste disposal is used.
- An estimated 198,000 individuals live in the Arkansas portion of the watershed (U.S. Census, 2000).
- 12 municipalities and portions of Washington and Benton counties as well as the University of Arkansas are subject to Phase II requirements for a small municipal separate storm sewer system (MS4) National Pollution Discharge Elimination System (NPDES) permit. With leadership from the Northwest Arkansas Regional Planning Commission, all of these entities have joined together to contract with the University of Arkansas Cooperative Extension Service to provide education and technical assistance.
- Northwest Arkansas produced more broilers in 2002 than any other area of the state, although production in other areas is gaining (NASS, 2002).
- The entire watershed is designated as a nutrient surplus area subject to new regulations for nutrient planning, nutrient application and certification of nutrient planners.
- 53.8% of the land area in the watershed was pasture in 1999 while 39.3% was in forest and 6.4% was urban. Nearly one-quarter of the land area changed uses between 1992 and 1999 (BAEG, 1999).
- The USFS estimated there were 62,643 acres of riparian areas in its 1999 assessment of aquatic conditions (USFS, 1999). Of these, nearly half were in agricultural use, primarily pasture.
- The USFS estimated there were 272.0 miles of roads in riparian areas in the Illinois River watershed in 1999, including 113.4 miles of unpaved roads (USFS, 1999).
- The watershed provides habitat for four federally protected aquatic species.

- Most forest land in the watershed is owned by private non-industrial landowners and the national forest.
- Resource extraction (e.g., topsoil removal, gravel mining) primarily supports local construction projects.
- The State of Oklahoma lists the Illinois River watershed on its inventory of impaired water bodies.

Water Quality/Program Goals

The Illinois River Watershed has been a priority of the Arkansas NPS Management Program since the comprehensive update of the program completed in 1998. ANRC is again designating the Illinois River watershed as a priority watershed for the 2006-2010 NPS Management Program Update. Pollutants of concern within this hydrologic unit area include: turbidity, siltation, nutrients and pathogens. Some of these pollutants cause some water bodies to not fully meet their designated uses (ADEQ, 2005).

ADEQ published its proposed 2004 303(d) List of Impaired Water Bodies for comment on February 20, 2005. This list identifies one impaired segment of the Illinois River portion of ADEQ planning segment 3J. There are no streams in the Illinois River watershed with an approved total maximum daily load (TMDL). Table 10.3 lists the streams in the watershed where the water body may be impaired, or one or more designated uses may not be attained.

Table 10.2: Illinois River watershed streams that may be impaired or one or more designated uses may not be attained

Stream Name	Reach	Miles	Impairment	Sources	Causes	Category
Clear Creek	-029	13.5	Primary Contact	Urban Runoff	Pathogens	5d

The long-term goal of the priority watershed program is to reduce pollutants to levels that will restore all designated uses. The short term goal of the program is to measurably reduce turbidity, nutrients and pathogens that reach waters of the Illinois River watershed, targeting sub-watersheds where implementation can have the greatest impact. These goals will be achieved through implementation of a Nine Element Plan, which replaces a previous Watershed Restoration Action Strategy (WRAS). ANRC submitted a draft Nine Element Plan to Environmental Protection Agency (EPA) in March 2004 (ANRC, 2004). The plan is being revised and will be resubmitted for EPA approval. Public support will have to be further developed to implement the proposed activities.

Objectives and Milestones

Based on the SWAT and other available analyses, ANRC will review available data and select sub-watersheds for targeting of implementation funds. Data that may be considered in targeting includes but is not limited to the modeled loads for sediment and phosphorus, percentage of intact woody riparian vegetation, density of unpaved roads,

number of stream road crossings, rural population density, density of animal feeding operations, degree of urbanization, potential sources of pollutants and population served by water supply intakes in the watershed. Other factors may also be considered at the discretion of ANRC, including but not limited to, local institutional capacity, input from the NPS Management Task Force, local watershed groups or other agencies, availability of funds and other factors.

The 2006-2010 NPS Management Program Update includes statewide programs aimed at reducing pollutant loads from land uses that have the potential to impact water quality. These land uses and programs to reduce their water quality impacts are described in more detail in earlier sections of the 2006-2010 NPS Management Program Update. Statewide programs that will be implemented in the Illinois River watershed and their relative level of priority are included in the table below.

Table 10.3: Relative priority of statewide programs to effect improvements in water quality in the Illinois River Watershed

Description of Land Use	Statewide Program	Intensity of Land Use/Potential Impact
Animal Agriculture	Agriculture	
▪ Confined animals		Very High
▪ Pasture (e.g., application of poultry litter to pasture, unconfined livestock)		Very high
Row Crop Agriculture	Agriculture	Not applicable
Forestry	Silviculture	
▪ Public lands		Low to moderate
▪ Industrial		Not applicable
▪ Private Non-Industrial		Low to Moderate
Urban	Household & Small Business	
▪ Rapidly urbanizing area subject to Phase II small separate municipal storm sewer system (MS4) NPDES permit requirements for stormwater management		Very High
Construction	Surface Erosion	
▪ Road & other infrastructure		Moderate to High
▪ Residential development		Very High
▪ Commercial/industrial		Very High
Onsite waste disposal	Household & Small Business	Very High
Stream bank modification	Surface Erosion	High
Surface mining (e.g., top soil removal, gravel mining)	Resource Extraction	Moderate to High

The following objectives and milestones were identified with input from the NPS Management Program Task Force. Cooperating entities are described in Section 3 of this plan. Table 3.3 identifies cooperating entities that will partner to implement the watershed program in the Illinois River.

- 10.1. Continue development of the Nine Element Plan until EPA approval is obtained.
Timeline for Milestones: October 2005 – September 2010
- 10.2. Continue to develop support for implementation of the Nine Element Plan among potential cooperating entities and the general public.
Timeline for Milestones: October 2005 – September 2010
- 10.3. Provide technical and financial assistance to local cooperating entities to implement the Nine Element Plan as resources allow.
Timeline for Milestones: October 2005 – September 2010
- 10.4. Promote and support strengthening of local capacity to implement the Nine Element Plan, encouraging local review of a range of options to identify the most effective institutional mechanism to lead implementation.
Timeline for Milestones: October 2005 – September 2010
- 10.5. Use remote sensing and Geographical Information Systems (GIS) analysis to identify sub-watersheds where more extensive assessment is needed. Conduct targeted geomorphological and bio-assessment to identify and target implementation of streambank stabilization projects for high impact sites. Promote use of riparian tax credits and cost-sharing programs to fund restoration projects and develop conservation easements.
Timeline for Milestones: October 2005 – September 2020
- 10.6. Continue to develop models to represent sediment and nutrient loads in the watershed, in-stream processes and lake response to enable prioritization of implementation projects in sub-watersheds.
Timeline for Milestones: October 2005 – September 2010
- 10.7. Continue to encourage the development of comprehensive nutrient management plans (CNMPs) or nutrient management plans (NMPs), provide technical assistance and make available financial assistance to animal agricultural operations where cost-share is a component of approved implementation projects.
Timeline for Milestones: October 2005 – September 2010
- 10.8. Continue and strengthen ongoing comprehensive education and training programs to help poultry and livestock producers meet the requirements of new ANRC poultry litter and nutrient application regulations and new ADEQ confined animal feeding operations (CAFO) regulations.
Timeline for Milestones: October 2005 – September 2010

- 10.9. Continue to develop and provide coordinated, comprehensive education for city planners, elected officials, developers, contractors, property owners and others using workshops, print and electronic materials, demonstration projects and other methods on topics such as: storm water pollution prevention plans, proper installation and maintenance of erosion and sediment control, planning tools to improve storm water management (e.g., low impact development, greenways, cluster development) and other related topics.
Timeline for Milestones: October 2005 – September 2020
- 10.10. Cooperate with and support the efforts of local nonprofit organizations, municipalities, and other cooperating entities to develop and deliver a coordinated environmental education program with a local emphasis.
Timeline for Milestones: October 2005 – September 2020
- 10.11. Identify groups for targeted education on specific high impact activities (e.g., develop and post fact sheets for boaters on proper waste disposal and the potential impact at boat ramps and marinas; provide training to county elected officials, road departments and property owners associations on how to reduce erosion from rural roads; or provide education to homebuilders, developers and homeowners on methods and activities to reduce NPS pollution) as resources allow.
Timeline for Milestones: October 2005 – September 2010
- 10.12. Identify severe erosion sites at rural road crossings and work with county government to develop and implement erosion control plans for high impact sites (e.g., promote use of conservation district hydromulcher for treatment).
Timeline for Milestones: October 2005 – September 2010
- 10.13. Encourage development of urban forestry projects in municipalities within the watershed.
Timeline for Milestones: October 2005 – September 2010
- 10.14. Carry out comprehensive information and education program quality for community leaders, including mayors, county judges, Quorum Courts, planning boards and commissions, Conservation District directors, and others. Emphasize the need to protect water and the benefits of clean water for the economy, quality of life and the environment.
Timeline for Milestones: October 2005 – September 2010
- 10.15. Continue to provide training to earth moving contractors and their employees, public works department employees, county employees and others regarding operation and maintenance of construction BMPs through the partnership with the Northwest Arkansas Regional Planning Commission and Cooperative Extension Service in order to help them meet the requirements of EPA phase II stormwater regulations for construction and municipal separate storm sewer systems.
Timeline for Milestones: October 2005 – September 2010

- 10.16. Review tax code to determine possible mechanisms to use tax incentives for water quality BMP implementation in nutrient surplus areas, especially for practices that minimize the direct impact of cattle on streams.

Timeline for Milestones: October 2005 – September 2010

- 10.17. Work with elementary and secondary teachers to develop teaching modules regarding water quality protection and conservation that meet curriculum requirements of the Arkansas Department of Education.

Timeline for Milestones: October 2005 – September 2010

- 10.18. Investigate the use of the Clean Water Revolving Loan Fund for alternative on-site wastewater systems.

Timeline for Milestones: October 2005 – September 2010

- 10.19. Build constituency for improved water quality by increasing volunteerism for cleanups and streambank restoration and other activities utilizing the Arkansas Game and Fish Commission Stream Team program and other conservation groups, conducting water awareness days, building working relationships with groups that represent recreational users (e.g., bird watchers, paddlers, hunters, etc), and other means.

Timeline for Milestones: October 2005 – September 2010

Timeline for Milestones

Provided sufficient human and financial resources are available to the cooperating entities working together in the Illinois River watershed, the short term objectives of this program can be met within five years of implementation of this update. Fully implementing management measures within the watershed to restore all designated uses is a longer term endeavor. A goal of this program is to fully meet designated uses within 15 years.

Program Coordination

There is currently no single entity in the Illinois River watershed with the authority to implement the Nine Element Plan. ANRC will work with cooperating entities in the watershed to promote voluntary coordination and incorporate conditions requiring cooperation in grant agreements, as appropriate. A high degree of voluntary coordination already exists in the agriculture program, through the Arkansas Conservation Partnership (ACP). In the construction and urban programs, there is significant coordination through a voluntary contractual agreement among municipalities, counties, the University of Arkansas, the Cooperative Extension Service and the Northwest Arkansas Regional Planning Commission to provide education and training on storm water management.

Federal Consistency

The lead agency for each statewide program is responsible for working with federal partners to promote federal consistency. Statewide programs and their lead agencies are identified in the Cooperating Entities Section of the 2006-2010 NPS Management Program Update. Watershed specific consistency issues may be addressed in other venues, such as the Arkansas-Oklahoma Compact Commission.

Program Tracking and Evaluation

Water quality monitoring data will be used to evaluate the effectiveness of nonpoint source pollution management activities in the Illinois River watershed. The ADEQ is responsible for maintaining the state's water quality inventory. They maintain eight monthly monitoring stations within the Illinois River Watershed. In addition, the USGS and ANRC maintain monitoring sites in the watershed. Real-time flow data are available at the USGS stations as well as some water quality data. ANRC monitoring stations focus on sediment, nitrogen and phosphorus-related parameters which are most significant in assessing nonpoint source pollution. Figure 10.4 shows all of the monitoring stations in the watershed.

Figure 10.4: Monitoring Stations in the Illinois River Watershed

<http://baeg.uark.edu/wml/files/nps-maps/final-report/illinois/illinois-monitoring.jpg>

Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

BMP implementation data will be tracked for ANRC projects. New biosecurity provisions included in the 2002 farm bill may make it difficult to obtain data files NRCS cost-share projects to monitor implementation of agriculture best management practices (BMPs). Implementation data for NRCS cost-share projects are available from the national NRCS website; however, data must be downloaded separately for each BMP, making the effort labor intensive and prone to human errors. Potentially, Conservation Districts could report aggregate BMP implementation by sub-watershed, thus maintaining confidentiality of landowners while still providing information needed for evaluation. Arkansas Forestry Commission (AFC) monitors silviculture BMP implementation biennially. ADEQ will monitor inspection and complaint data for related regulatory programs it administers (e.g., surface mining, NPDES permits, etc).

The NPS Management Program may include pre- and post-project measurements of changes in water quality as a condition of funding. The NPS Management Program encourages cooperating entities working in the watershed to meet annually to report on their activities of the previous year and frankly discuss their successes, failures and future needs of their programs. Local cooperators are encouraged to compile this information, along with a summary of available water data and land use trends, into an annual watershed status report published and distributed in the watershed and to interested parties outside the watershed.

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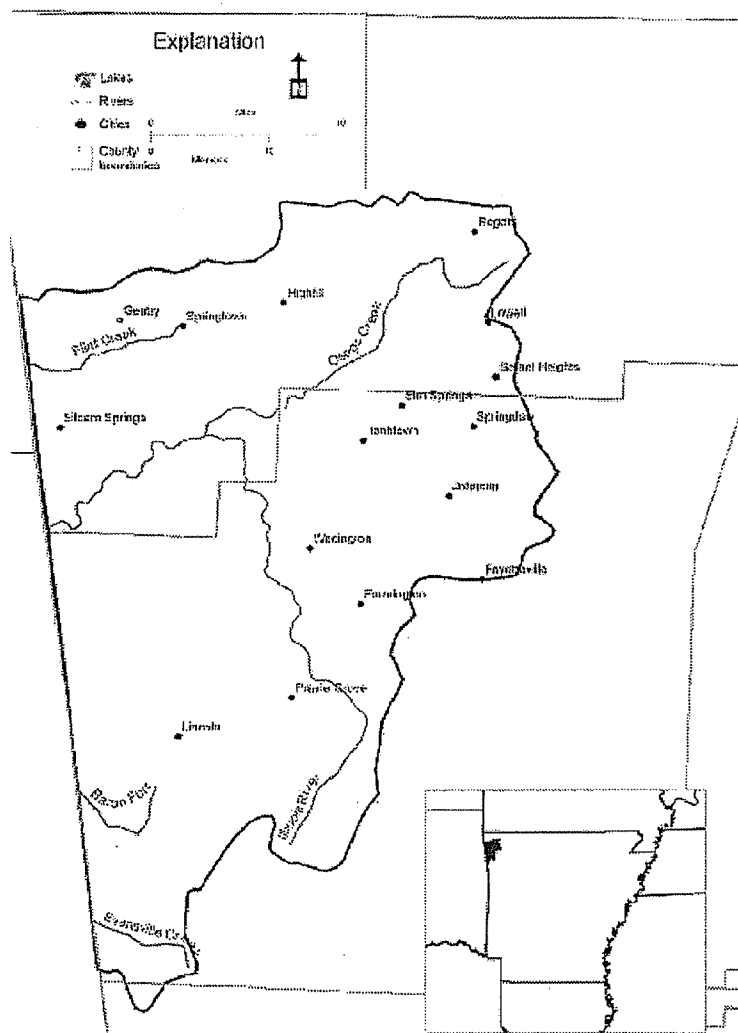
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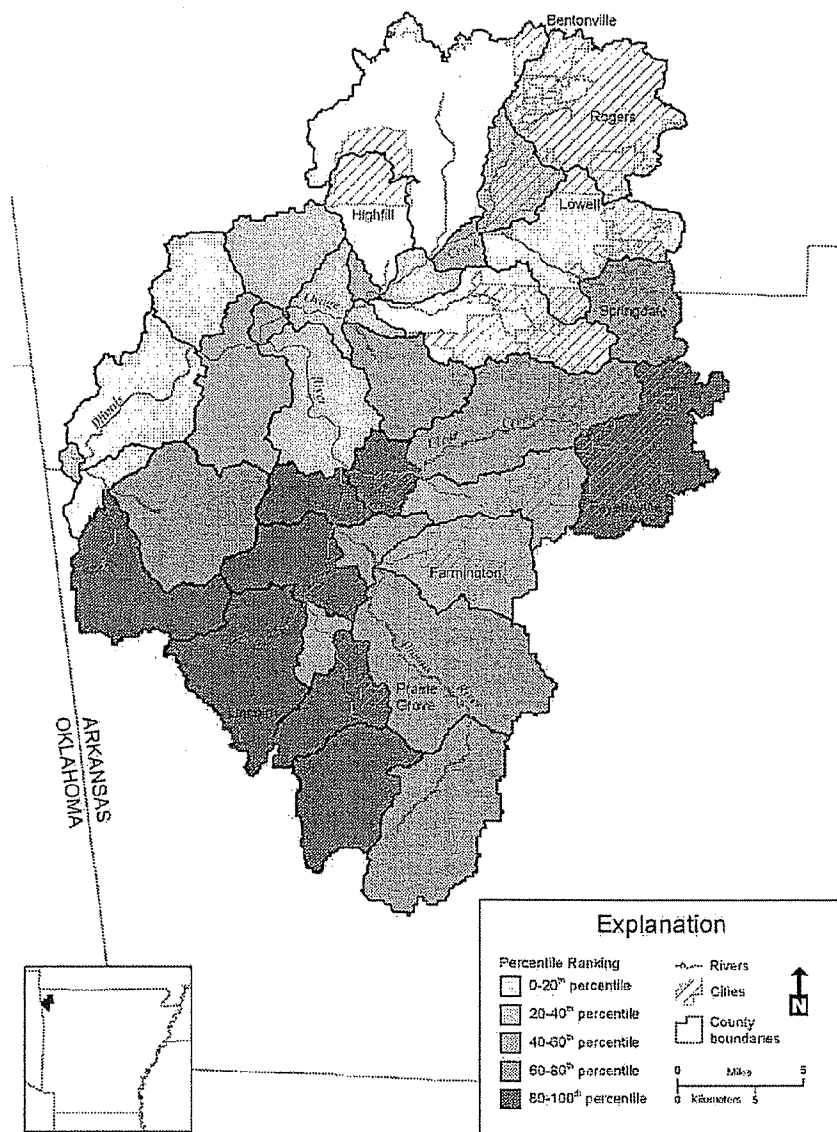
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Figure 10.1: Map of the Illinois River Watershed



Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

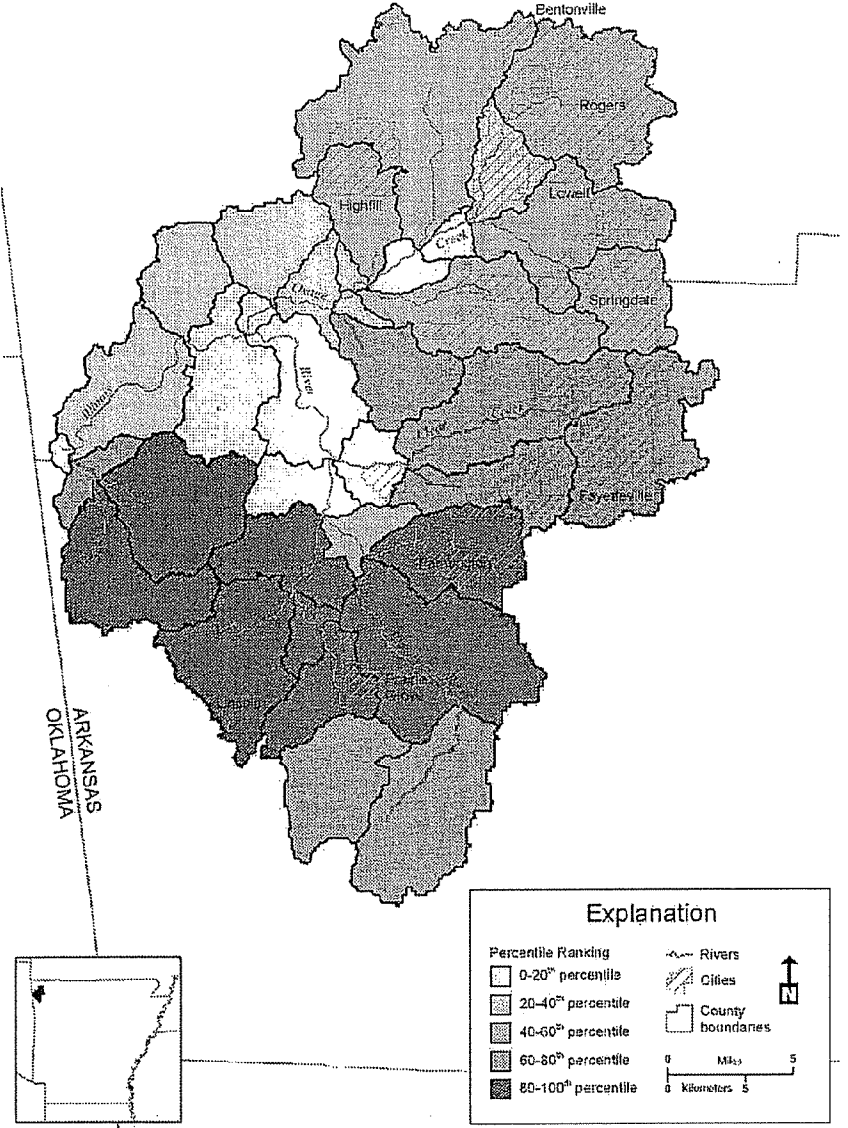
Figure 10.2a: Relative estimates of contribution of Illinois River sub-watersheds to total estimated runoff using SWAT



Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

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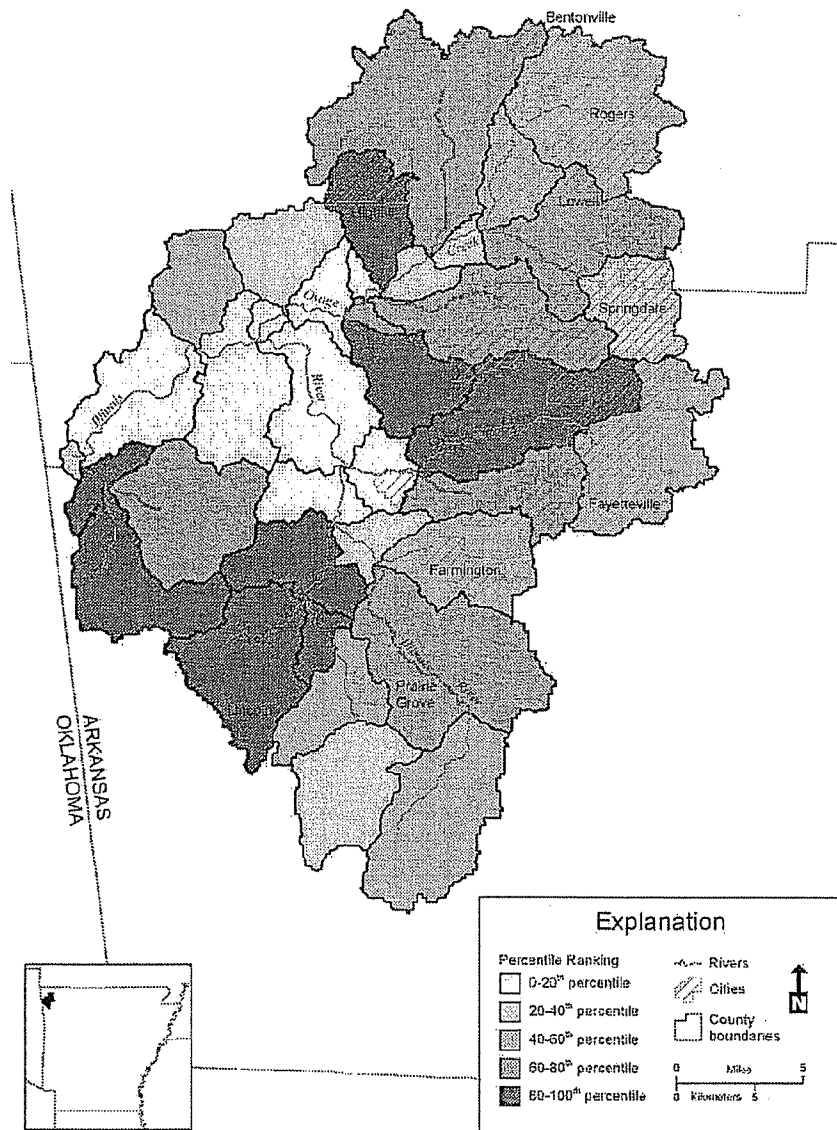
Figure 10.2b: Relative estimates of contribution of Illinois River sub-watersheds to total estimated sediment using SWAT



Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

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Figure 10.2c: Relative estimates of contribution of Illinois River sub-watersheds to total estimated nitrogen using SWAT

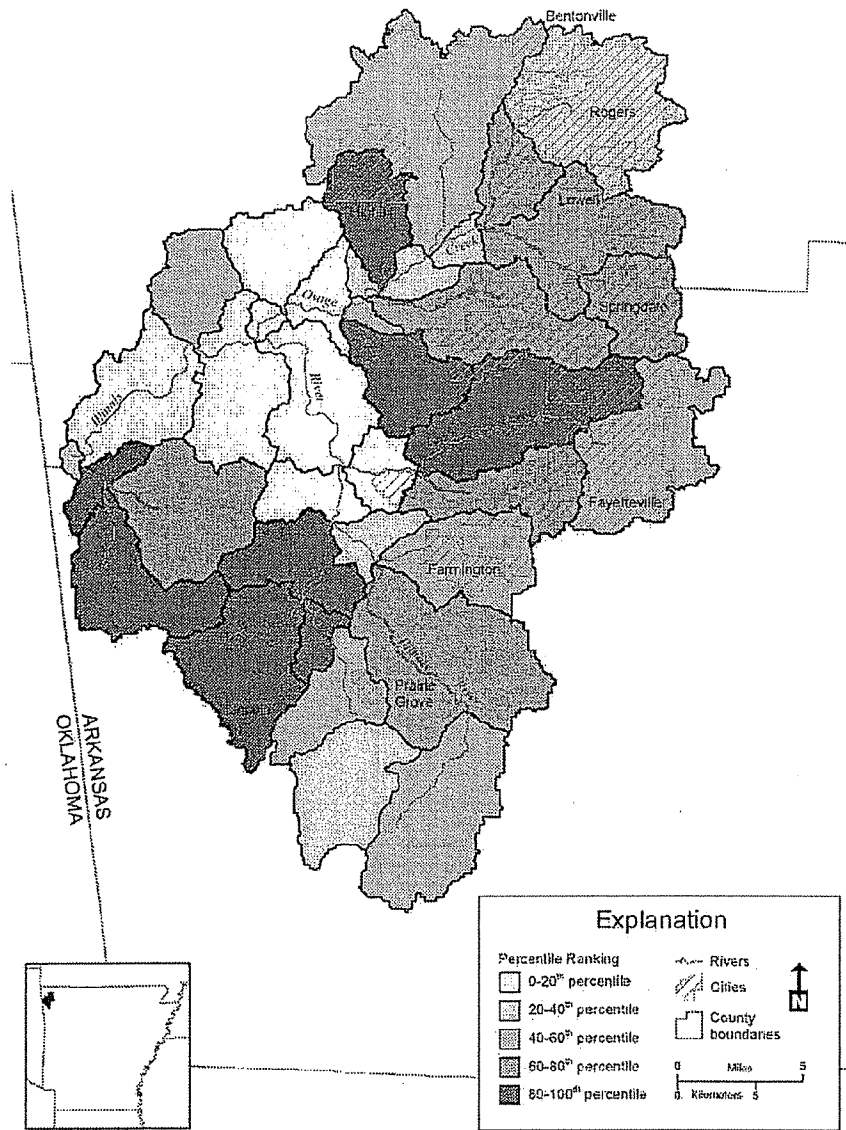


Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

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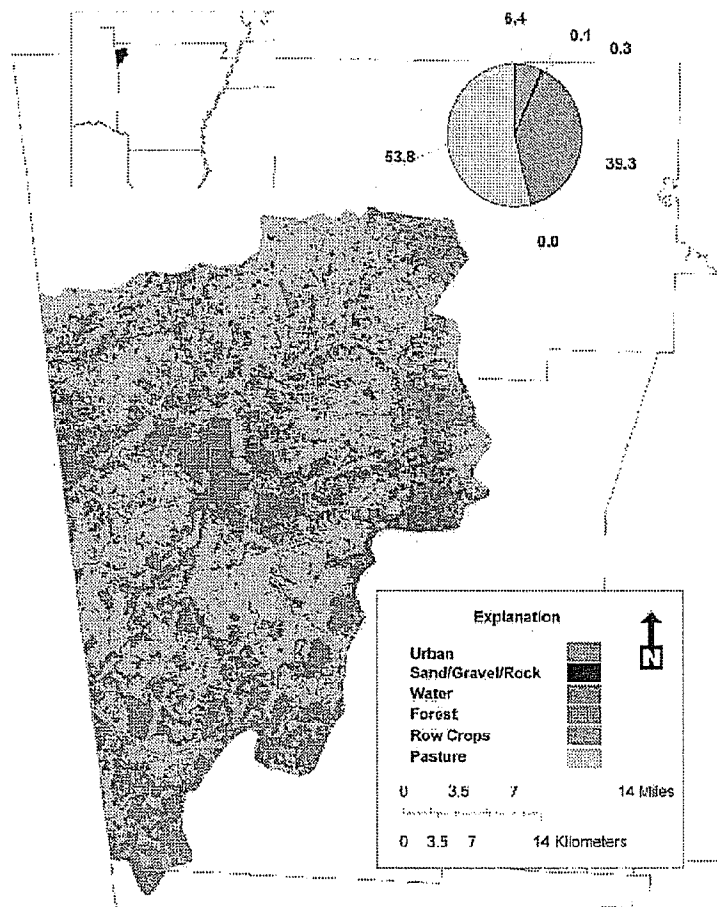
Figure 10.2d: Relative estimates of contribution of Illinois River sub-watersheds to total estimated phosphorus using SWAT



Source: University of Arkansas, Department of Biological and Agricultural Engineering, 2005

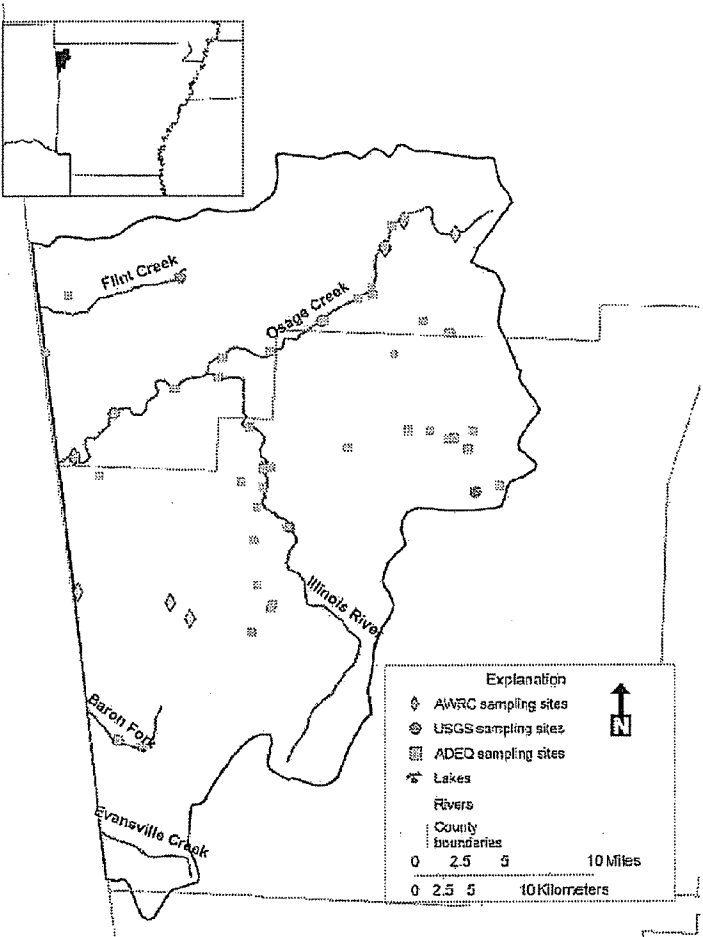
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Figure 10.3: Distribution of land uses in the Illinois River Watershed



Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

Figure 10.4: Monitoring Stations in the Illinois River Watershed



Source: University of Arkansas Department of Biological and Agricultural Engineering, 2005

